

memorandum



Date: February 15, 2012

To: **Mr. Kunle Odumade**
City of Fremont

From: Mark Spencer
Tony Henderson

Project: FRM007

Subject: Niles Canyon Road Truck Restriction Study – Initial Study

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Summary of Findings

The City of Fremont has initiated the process to potentially restrict large trucks, defined as five tons or larger, on Niles Canyon Road (State Route 84), between Mission Boulevard in the City of Fremont and Paloma Way near Interstate 680 (I-680) in unincorporated Alameda County. Currently, this route carries between 11,200 and 14,110 vehicles per day, of which 3.4 percent to 7.1 percent are large trucks with three axles or more (270 to 543 trucks in the eastbound direction and 210 to 381 trucks in the westbound direction). The corridor experiences peak hour congestion with average operations ranging from Level of Service (LOS) C to LOS E. The eastbound direction generally has greater congestion during the evening peak period, while worse conditions exist for the westbound direction in the morning.

The collision history for the corridor was reviewed for the period including 2001 through 2009, and for this period the corridor experienced a calculated collision rate that was slightly lower than the statewide average for similar facilities. The portion of collisions that resulted in injuries was higher than the statewide average, although the fatality rate associated with collisions was lower. The proportion of collisions involving large trucks was similar to the proportion of truck traffic along the corridor. It also was found that after Caltrans installed a center line rumble-strip on Niles Canyon Road in 2007 the average number of collisions per year decreased.

Potential alternative truck routes were evaluated. If trucks are restricted on Niles Canyon Road, it is expected that the most likely alternative route would be along I-680 and Mission Boulevard. This would result in increased travel time for truck drivers, and a negligible change in overall SR 84 corridor operations and congestion. Most signalized intersections along Mission Boulevard would experience a less-than-significant change in average delay with the addition of more peak hour trucks. The one exception would be the Mission Boulevard/Palm Avenue intersection during the a.m. peak hour, which currently operates at LOS E; it would experience an increase of more than four seconds in average delay as a result of the additional trucks passing through the intersection. The truck restriction would also add additional truck traffic to the segment of I-680 between SR 84 and the north Mission Boulevard interchange; this segment of I-680 currently operates at LOS F during the a.m. peak hour in the southbound direction.

It is reasonable to anticipate that the truck restriction would result in an overall decrease in collisions due to the reduced volume; however, since the rate of collisions involving trucks on SR 84 is similar to the proportion of truck traffic on the route, the calculated collision rate would be unlikely to change since a decrease in truck collisions would likely be proportional to a decrease in overall traffic volume on the corridor.

Following is the initial study for the Niles Canyon Road Truck Restriction Study being conducted for the City of Fremont. The memo is organized as follows:

1. Study Purpose and Background
2. Existing Conditions
3. Conditions with Trucks Restricted

I. Study Purpose and Background

The City of Fremont has initiated the process required by the California Department of Transportation (Caltrans) to restrict trucks on Niles Canyon Road (State Route 84) between Mission Boulevard (State Route 238) and Paloma Way near I-680; the study area is shown on the attached Figure 1. An Initial Study is one of the major steps in the Caltrans Truck Restriction Process as it provides the information necessary to justify the proposed restriction, as well as potentially indicating whether the proposed restriction is subject to California Environmental Quality Act (CEQA) review. The Initial Study also allows for the preliminary submittal of information by a wide array of potential stakeholders, including Caltrans, local agencies, California Highway Patrol staff, the trucking industry, other affected industries and citizen groups.

Among the key elements of the study are the percentage of trucks that use Niles Canyon Road, the collision rate and predominant causes, and the potential concerns with re-routing of trucks away from Niles Canyon Road.

Niles Canyon Road

Niles Canyon Road (SR 84) connects the City of Fremont to the west with I-680 to the east. Portions of Niles Canyon Road are located within the Cities of Fremont and Union City and unincorporated Alameda County; however, since it is a state highway, the road is operated by Caltrans.

The largely rural road is located on a rolling terrain with a posted speed limit of 45 miles per hour (mph). Niles Canyon Road is flanked mostly by residential land uses, along with a quarry, a commercial nursery and several religious institutions. The route also provides connections to Sunol, a community in unincorporated Alameda County located at the eastern end of Niles Canyon Road. The southern terminus of Palomares Road is located along Niles Canyon Road. Palomares Road is a narrow, winding rural road connecting I-580 to Niles Canyon Road, with low-density residential land uses as well as wineries and religious institutions.

Caltrans Improvement Plans

Caltrans is finalizing design plans that are intended to improve safety along the route. These plans include widening of curves, increasing curve radius and providing shoulders; however, due to some constraints, a shoulder would not be consistently provided along the entire route.

2. Existing Conditions

Existing traffic volume data were collected at three locations along Niles Canyon Road (east of Mission Boulevard, west of Paloma Way and mid-segment) and two locations along Mission Boulevard (north and south of Niles Canyon Road) on Tuesday, September 13 through Thursday, September 15, 2011. The data collected are summarized in Table 1. The overall average daily traffic Niles Canyon Road varied between 11,200 and 14,110 vehicles per day. In the mornings, traffic flow in the westbound direction dominates, with commuters traveling between eastern Alameda and Contra Costa Counties to

Fremont and destinations throughout Silicon Valley. This commute pattern correspondingly switches to the eastbound direction during the evening. Currently trucks with three or more axles represent between 3.4 percent and 7.1 percent of daily traffic Niles Canyon Road. The existing traffic volumes are shown on Figure 2, which is attached.

As part of the data collection, travel speeds were collected on Niles Canyon Road at the mid-segment location, which is west of Palomares Road. The data were reported in 5-mph increments and it was found that the 85th percentile of traffic was between 45 and 50 mph, which is consistent with the posted speed limit of 45 mph on Niles Canyon Road.

Mission Boulevard (SR 238) currently experiences an overall average daily traffic volume between 13,100 to 15,600 vehicles per day, with slightly less traffic to the north of the intersection with Niles Canyon Road than to the south. Trucks on Mission Boulevard represent between 6.0 to 7.9 percent of traffic to the north of Niles Canyon Road, increasing to 8.9 to 9.5 percent to the south of Niles Canyon Road.

Table I
Existing Traffic Volumes on Niles Canyon Road

Count Location	% Truck	Daily Volume		AM Peak Hour Volume		PM Peak Hour Volume	
		Total	Truck	Total	Truck	Total	Truck
Niles Canyon Rd							
East of Mission Blvd	6.55%	14,117	924	1,356	85	1,406	95
<i>Eastbound</i>	7.09%	7,664	543	393	28	1,021	72
<i>Westbound</i>	5.91%	6,453	381	963	57	385	23
Mid Segment	5.72%	14,373	822	1,349	75	1,491	87
<i>Eastbound</i>	6.03%	7,812	471	402	24	1,079	65
<i>Westbound</i>	5.35%	6,561	351	947	51	412	22
West of Paloma Way	4.73%	11,222	531	945	41	1,095	54
<i>Eastbound</i>	6.29%	5,107	321	324	20	566	36
<i>Westbound</i>	3.43%	6,115	210	621	21	529	18
Mission Blvd							
North of Niles Canyon Rd	6.91%	28,234	1,951	2,760	187	2,506	175
<i>Northbound</i>	7.93%	13,107	1,039	1,115	88	1,231	98
<i>Southbound</i>	6.03%	15,127	912	1,645	99	1,275	77
South of Niles Canyon Rd	9.16%	31,091	2,849	2,466	229	2,739	250
<i>Northbound</i>	8.85%	15,627	1,383	878	78	1,614	143
<i>Southbound</i>	9.48%	15,464	1,466	1,588	151	1,125	107

Note: % Truck includes all vehicles with three or more axles

Traffic volumes for I-680 were provided by Caltrans, with the most recent data collected in 2006. Near Niles Canyon Road, I-680 has an average daily traffic volume of approximately 140,000. During the morning peak hour, the hourly volume is about 11,100 vehicles, of which 73 percent is traveling in the southbound direction. In the evening peak hour, the hourly volume is approximately 10,900 vehicles, of

which 67 percent travel in the northbound direction. Data published by Caltrans indicates that trucks represent approximately 8 percent of the total volume on I-680; however, it should be noted that the most recently available truck data were last collected in 1994.

Existing Traffic Operations

The existing roadway Level of Service (LOS) was calculated using the Two-Lane Highway Methodology published in Chapter 15 of the 2010 edition of the Highway Capacity Manual (HCM) (Transportation Research Board, Special Report 209, 2010). For a Class II Two-Lane Highway, which most closely describes Niles Canyon Road, the metric used for determining the LOS is percent of time spent following (PTSF) that “represents the freedom to maneuver and the comfort and convenience of travel.”

Since trucks are larger than other vehicles on the road, generally travel slower and take more time to accelerate and decelerate, a passenger car equivalent (PCE) factor is applied to truck volumes to account for this increased size. The PCE for each scenario was calculated based on total vehicle traffic volume and the percent of trucks using equations presented in the HCM.

Currently, the eastbound direction of Niles Canyon Road operates between LOS C and LOS F during the weekday a.m. peak hour and LOS D to LOS F during the weekday p.m. peak hour. These results are summarized in Table 2, and the detailed analysis is provided as an attachment to this memo.

Table 2
Existing Conditions on Niles Canyon Road

Direction	AM Peak Hour			PM Peak Hour		
	Volume	PTSF¹	LOS²	Volume	PTSF¹	LOS²
East of Mission Blvd						
<i>Eastbound</i>	393	64.1%	C	1,021	92.2%	E
<i>Westbound</i>	963	90.7%	E	385	63.3%	C
Mid Segment						
<i>Eastbound</i>	402	63.7%	C	1,079	93.4%	E
<i>Westbound</i>	947	89.5%	E	412	65.5%	C
West of Paloma Way						
<i>Eastbound</i>	324	60.7%	C	566	77.2%	D
<i>Westbound</i>	621	80.5%	D	529	75.5%	D

Note: ¹ PTSF = Percent Time Spent Following

² LOS = Level of Service. LOS is calculated only in each direction during the peak hours

Collision History and Route Safety

The following is a summary of the recent collision history and safety analysis for Niles Canyon Road.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision data were provided by the City of Fremont (as provided by the

Transportation Engineering Division) for a period of ten years from January 1, 2000, through December 31, 2009, and were for the entire segment of SR 84 from Mission Boulevard to I-680. Although the proposed restriction would apply only to the Niles Canyon Road portion of SR 84, and not the portion of SR 84 that is coincident with Paloma Way, the data analyzed is representative of collision trends on the Niles Canyon Road portion of SR 84.

As presented in Table 3, the calculated collision rates for the study corridor were compared to average collision rates for similar facilities statewide, as published by Caltrans in *2007 Accident Data on California State Highways*. Since the corridor operates as a rural route, although it is partly within City Limits, the statewide average rates for similar rural roads were used for this analysis. The collision history is discussed in more detail below, and collision rate calculations along with collision data provided by the City are attached for reference.

Table 3
Collision Data for the Study Segments (2001 – 2009)

	Number of Collisions	Collision Rate (c/mvm)¹	Injury Rate	Fatality Rate
SR 84 (Mission Boulevard to I-680)	399	1.12	51.4%	2.5%
Statewide Average ²	--	1.18	45.1%	3.4%

Note: ¹ c/mvm = collisions per million vehicles miles

² Source: *2007 Accident Data on California State Highways*. Data for 2001 through 2009

SR 84 experienced a total of 399 reported collisions from 2001 through 2009, resulting in a calculated collision rate of 1.12 collisions per million vehicle miles traveled (c/mvm); this is slightly lower than the statewide average of 1.18 c/mvm for similar facilities. A higher percentage of collisions resulted in injuries, 51.4 percent compared to a statewide average of 45.1 percent. Furthermore, ten collisions, or 2.5 percent, resulted in fatalities, which is less than the statewide average of 3.4 percent.

Of the 399 reported collisions, 146 collisions, or 36.6 percent involved trucks; however, 82.2 percent of these trucks were classified as “pickup/panel truck.” Excluding pickup trucks and panel trucks, approximately 4.4 percent of collisions involved large trucks which is generally similar to the 3.4 to 7.1 percent of large (three or more axle) truck traffic on Niles Canyon Road.

Installation of Rumble Strip

In 2007, Caltrans installed a center line rumble-strip along Niles Canyon Road with the goal of reducing cross-over collisions. While this rumble strip does not fully prevent cross-over collisions, it provides drivers with audible and tactile cues that they are crossing the center line, thus prompting them to undertake corrective maneuvering. The number of collisions per year was compared for the time periods before and after installation of the rumble strip in 2007, as summarized in Table 4. Since installation of the rumble strip occurred in 2007, all collision data for 2007 was excluded to remove any influence of construction activity. For the entire SR 84 segment, prior to installation of the rumble strip, there was an average of 44.9 collisions per year, which decreased to 24.5 collisions per year following installation of the rumble strip.

Table 4
Collision Rates Before and After Rumble Strip Installation

	Prior to Installation (2000 – 2006)		After Installation (2008 – 2009)	
	Collisions	Average Collisions/year	Collisions	Average Collisions/year
SR 84 (Mission Blvd to I-680)	314	44.9	49	24.5

Note: Center-line Rumble Strip was installed mid-year 2007

3. Conditions with Trucks Restricted

Legislation

The Surface Transportation Assistance Act of 1982 (STAA), establishes a national network of truck routes for the purpose of interstate commerce. In California, the maximum sized, “California Legal” truck is smaller than the maximum sized truck allowed under the STAA for interstate commerce. Because of this, a specific national STAA route system has been established to accommodate these larger, interstate trucks.

Types of Truck Routes

STAA National Network – includes all federal freeways within the National System of Interstate and Defense Highways. These facilities are not specifically marked as truck routes since all federal Interstate routes are included.

Terminal Access Routes – state and local routes that can accommodate STAA trucks and are signed at decision points indicating the route (California MUTCD sign G66-56).

California Legal Routes – all State highways can accommodate California Legal trucks, except those with specific restrictions. These routes are not intended to accommodate STAA trucks unless identified as a Terminal Access Route.

California Legal Advisory Route – these are California Legal routes that have advised length limits based on the route’s geometrics. Full-sized California Legal trucks are not prohibited from using these routes, but the driver would likely experience difficulty negotiating the route.

Additionally, special restrictions have been established on some routes and can include limitations on length, weight or number of axles of the vehicle or those transporting flammable, hazardous or explosive materials.

Regional Truck Routes

The following truck routes have been identified in the vicinity of Niles Canyon Road:

- I-680 and I-880 are STAA Routes
- Mission Boulevard (SR 238) is identified as a Terminal Access Route
- Niles Canyon Road (SR 84) is included in the California Legal Route Network; however, transportation of hazardous materials is prohibited on the route due to the proximity to a surface

drinking water source. Signs are provided at access points to Niles Canyon Road indicating this restriction.

Network maps showing these routes, including any restrictions or prohibitions, are published by the Federal Highway Administration (FHWA), Caltrans and local jurisdictions. The published truck route maps for both the City of Fremont and Caltrans Bay Area Region are attached for reference.

Potential Truck Restriction

The potential restriction being studied would prohibit trucks over five tons (10,000 pounds) in weight from traveling on Niles Canyon Road between Mission Boulevard and Paloma Way (on SR 84, between Post Miles 10.820 and 17.287). This would restrict some two-axle trucks, but would likely restrict all three-axle and larger trucks from traveling on the route. Local deliveries would be exempted from the restriction.

Alternate Truck Routes

Any truck restriction on Niles Canyon Road would result in truck drivers rerouting to alternate travel routes. The likely alternate routes would include Mission Boulevard and I-680, south of Niles Canyon Road. These alternate routes are shown on the attached Figure 3.

Travel Times

Typical travel times for trucks on Niles Canyon Road and the potential alternate routes were measured during a typical evening peak period of 4:00 p.m. to 6:00 p.m. on Thursday, September 22, 2011. Table 5 below is a summary of the observed travel times for Niles Canyon Road and the likely alternate routes. Two travel time runs were measured for each route, with the average result reported. Based on these data collected, it is expected that with the implementation of the truck restrictions on Niles Canyon Road, travel time for westbound truck drivers would increase by 59 percent, or approximately six minutes, and westbound drivers would experience an increase in their travel time of 14 percent, or slightly more than 2.25 minutes. The alternative routes with truck travel times are shown on Figure 3.

Table 5
Truck Travel Time Comparison

Travel Direction	Average Travel Time (minutes:seconds)			Percent Increase on Alternate Route
	Niles Canyon Rd	Alternate Route	Difference	
Westbound	10:17	16:18	6:01	59%
Eastbound	16:37	18:56	2:19	14%

Note: Eastbound alternative route does not include any delay associated with the truck weigh station located on I-680

The large difference in the increase to travel time between eastbound and westbound Niles Canyon Road is attributed to the all-way stop controlled intersection of Niles Canyon Road/Paloma Way, where eastbound traffic experiences delays that occasionally exceed several minutes per vehicle. It is important to note that these travel times do not include delay associated with the need for truck drivers to stop at the Truck Weigh Station located on northbound I-680, which would potentially increase the delay on the eastbound alternate route.

Travel time data were collected during the evening peak period as traffic on Niles Canyon Road experiences the most delay during this time period (mostly eastbound traffic, with delays largely associated with the stop-controlled intersection with Paloma Way as noted above). Based on traffic volume data collected, the critical traffic direction during the evening is eastbound on Niles Canyon Road and northbound on I-680 with the opposite directions being critical during the morning.

Roadway Traffic Operations with Truck Restrictions

The roadway segment Levels of Service were calculated for Niles Canyon Road with truck traffic reduced to one percent of existing total traffic (some truck traffic was assumed to remain that would be local serving). It was found that there would be a negligible difference in overall roadway operations with the removal of truck traffic. These results are summarized in Table 6 and Table 7. The anticipated traffic volumes on Niles Canyon Road adjusted for the truck restriction are shown on Figure 4.

Table 6
AM Peak Hour Traffic Volumes and Operations on Niles Canyon Rd with Truck Restrictions

Direction	Existing				With Restriction			
	Total Vol¹	Truck Vol	PTSF²	LOS³	Total Vol	Truck Vol	PTSF	LOS
East of Mission Blvd								
<i>Eastbound</i>	393	28	64.1%	C	369	4	61.0%	C
<i>Westbound</i>	963	57	90.7%	E	916	10	89.8%	E
Mid Segment								
<i>Eastbound</i>	402	24	63.7%	C	382	4	62.0%	C
<i>Westbound</i>	947	51	89.5%	E	906	10	89.0%	E
West of Paloma Rd								
<i>Eastbound</i>	324	20	60.7%	C	307	3	57.9%	C
<i>Westbound</i>	621	21	80.5%	D	606	6	80.0%	D

Notes: ¹Vol = Traffic Volume

²PTSF = Percent Time Spent Following

³LOS = Level of Service. LOS is calculated only in each direction during the peak hours

Table 7
**PM Peak Hour Traffic Volumes and Operations on Niles Canyon Road with Truck
 Restrictions**

Direction	Existing				With Restriction			
	Total Vol¹	Truck Vol	PTSF²	LOS³	Total Vol	Truck Vol	PTSF	LOS
E of Mission Blvd								
<i>Eastbound</i>	1,021	72	92.2%	E	959	10	91.4%	E
<i>Westbound</i>	385	23	63.3%	C	366	4	62.1%	C
Mid Segment								
<i>Eastbound</i>	1,079	65	93.4%	E	1,025	11	91.9%	E
<i>Westbound</i>	412	22	65.5%	C	394	4	63.3%	C
W of Paloma Rd								
<i>Eastbound</i>	566	36	77.2%	D	536	6	76.4%	D
<i>Westbound</i>	529	18	75.5%	D	516	5	74.4%	D

Notes: ¹Vol = Traffic Volume

²PTSF = Percent Time Spent Following

³LOS = Level of Service. LOS is calculated only in each direction during the peak hours

Since truck traffic would be rerouted to alternate routes, the majority of which would be on Mission Boulevard and I-680, any decrease in truck traffic on Niles Canyon Road would result in a corresponding increase in truck traffic on these alternate routes.

Impacts to Alternative Routes

The proposed restriction would result in the majority of restricted trucks being redirected to I-680 south of Niles Canyon Road and Mission Boulevard between Niles Canyon Road and I-680. To determine the impact of this redirected truck traffic, the level of service (LOS) for several key signalized intersections along Mission Boulevard, and also for the freeway segment of I-680 between SR 84 and the north Mission Boulevard interchange was determined based upon methodology published in the 2000 version of the Highway Capacity Manual (HCM).

Intersection Operations

The City of Fremont, in its General Plan, establishes an acceptable LOS for signalized intersections as being LOS D or better. A project's impact would be significant if it would cause an intersection currently operating at LOS D or better to operate at LOS E or worse; however, if an intersection currently operates at LOS E or worse, a project's impact is considered significant if its impact results in an increase of four or more seconds of average delay.

Intersection operations for existing conditions and conditions with the truck restriction are shown in Table 8 and calculations are attached for reference. The restriction would not result in a significant change in intersection operations, except at the Mission Boulevard/Palm Avenue intersection during the a.m. peak hour. This intersection currently operates at LOS E and the added trucks passing through the intersection would result in about eight seconds of additional average delay.

Table 8
Summary of Existing and Existing with Restriction
Peak Hour Intersection Level of Service Calculations

Study Intersection	Existing Conditions				With Restriction			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Mission Boulevard/Niles Canyon Road	64.1	E	48.5	D	67.3	E	48.6	D
Mission Boulevard/Mowry Avenue	26.6	C	25.2	C	26.2	C	25.3	C
Mission Boulevard/Walnut Avenue	45.5	D	33.7	C	49.4	D	33.9	C
Mission Boulevard/Stevenson Boulevard	20.2	C	20.2	C	21.4	C	20.5	C
Mission Boulevard/Driscoll Road	18.5	B	47.9	D	19.3	B	49.9	D
Mission Boulevard/Palm Avenue	65.3	E	22.6	C	73.4	E	22.6	C
Mission Boulevard/I-680 Southbound	12.4	B	9.7	A	12.8	B	9.7	A
Mission Boulevard/I-680 Northbound	20.7	C	23.7	C	20.7	C	23.7	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation

Freeway Operations

The Alameda County Transportation Commission (ACTC) which is responsible for planning of regional routes, such as I-680, has established an acceptable threshold of LOS E. Currently, the segment of I-680 between SR 84 and Mission Boulevard operates unacceptably at LOS F in the morning peak hour in the southbound direction. The proposed truck restriction would add to the volume to capacity (v/c) ratio of the southbound segment by 0.01 in the morning peak hour. The segment of I-680 in the northbound direction during the morning peak hour and both directions in the evening peak hour currently operate acceptably and would continue to do so with the addition of trucks associated with the truck restriction on Niles Canyon Road. Freeway segment LOS results are summarized in Table 9 and calculations are attached for reference.

Table 9
Summary of Peak Hour Freeway Segment Level of Service Calculations

Study Segments	Existing Conditions				With Restriction			
	AM Peak		PM Peak		AM Peak		PM Peak	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
I-680 between Mission Boulevard and SR 84								
Northbound	0.37	B	0.91	E	0.38	B	0.93	E
Southbound	1.10	F	0.48	B	1.11	F	0.49	B

Notes: v/c = volume to capacity ratio; LOS = Level of Service; **Bold** text = deficient operation

Route Safety

It was found that the portion of collisions involving trucks was similar to or less than the percentage of truck traffic on Niles Canyon Road. Because of this, it is likely that any restrictions on truck traffic on the route would result in correspondingly fewer overall collisions, but would have minimal impact to the calculated collision rate if any reduction in collisions is proportional to the reduction in traffic volumes.

Trucking Industry

Potential truck restrictions along Niles Canyon Road would result in increased travel distances and travel times for truck drivers who currently use the route. During the p.m. peak hour, this increased delay would be about six minutes for westbound trucks and two minutes for eastbound trucks.

Local Serving Trucking

Residents and business owners along Niles Canyon Road would encounter fewer trucks being driven along the route and slightly less traffic overall. Any residents or business owners who own or operate vehicles in excess of five tons would still be able to drive their vehicle to and from their residences, as truck traffic with either an origin or destination along Niles Canyon Road would be exempt from this potential restriction. However, these trucks could be stopped by a law enforcement officer to verify compliance with the restriction, which would result in delay.

Enforcement

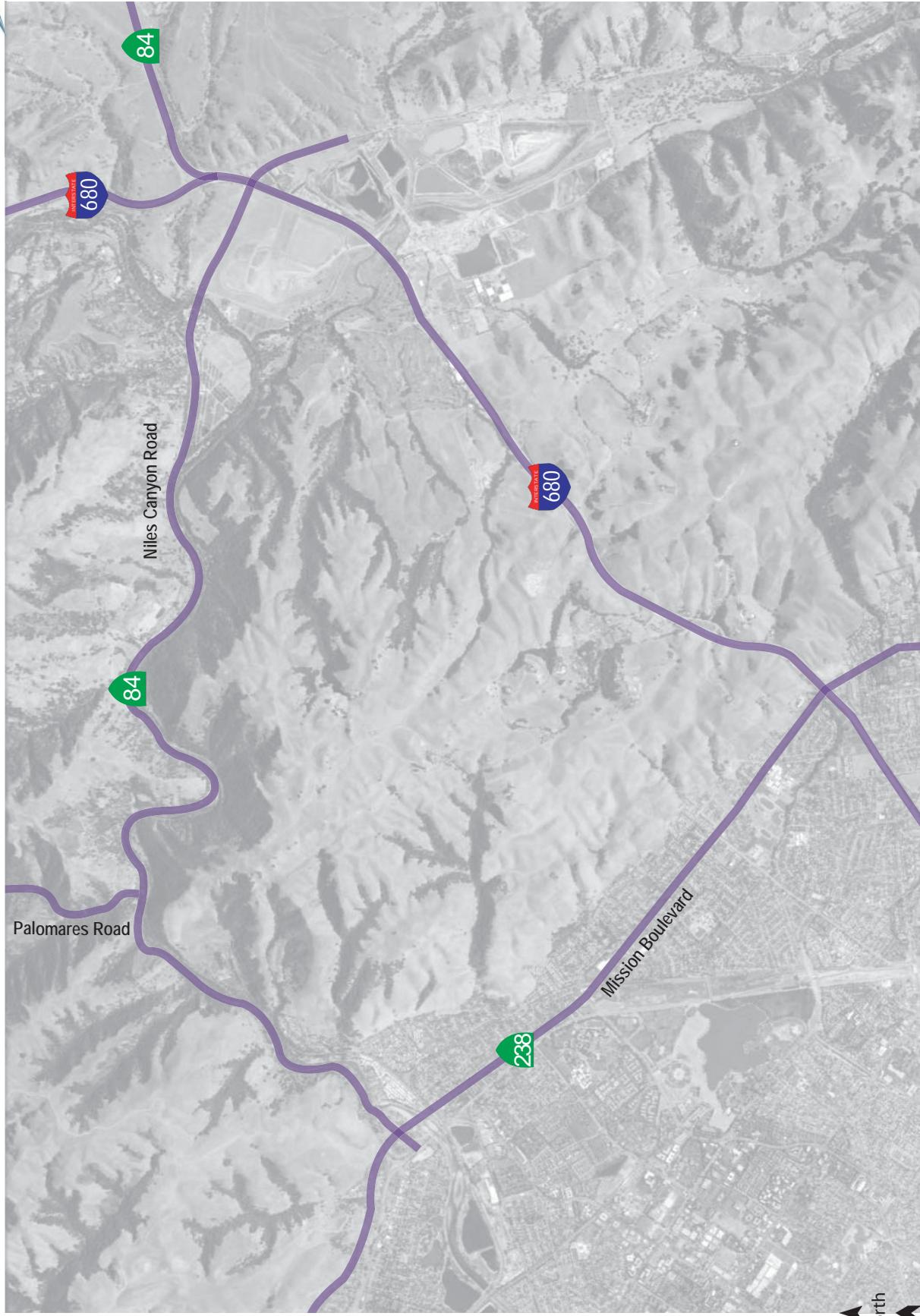
A truck restriction would require additional enforcement activity by law enforcement agencies, likely the California Highway Patrol (CHP) and the City of Fremont Police Department.

Stakeholder Involvement

A meeting was held on January 18, 2012 to advise stakeholders of the impacts associated with the potential restriction and to obtain feedback from these stakeholders. Attached is a memorandum summarizing the comments received at this meeting.

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Attachments: Figure 1 – Study Area
Figure 2 – Existing Traffic
Figure 3 – Alternative Route Average Time
Figure 4 – Anticipated Average Daily Traffic with Truck Restriction
Level of Service Calculations
Collision Rate Calculations
Truck Route Maps
Intersection LOS Calculations
Freeway LOS Calculations
Memorandum: Niles Canyon Road Truck Restriction Study – Comments Received at the January 18, 2012 Stakeholders Meeting



Niles Canyon Road (State Route 84) Truck Restriction Study
City of Fremont

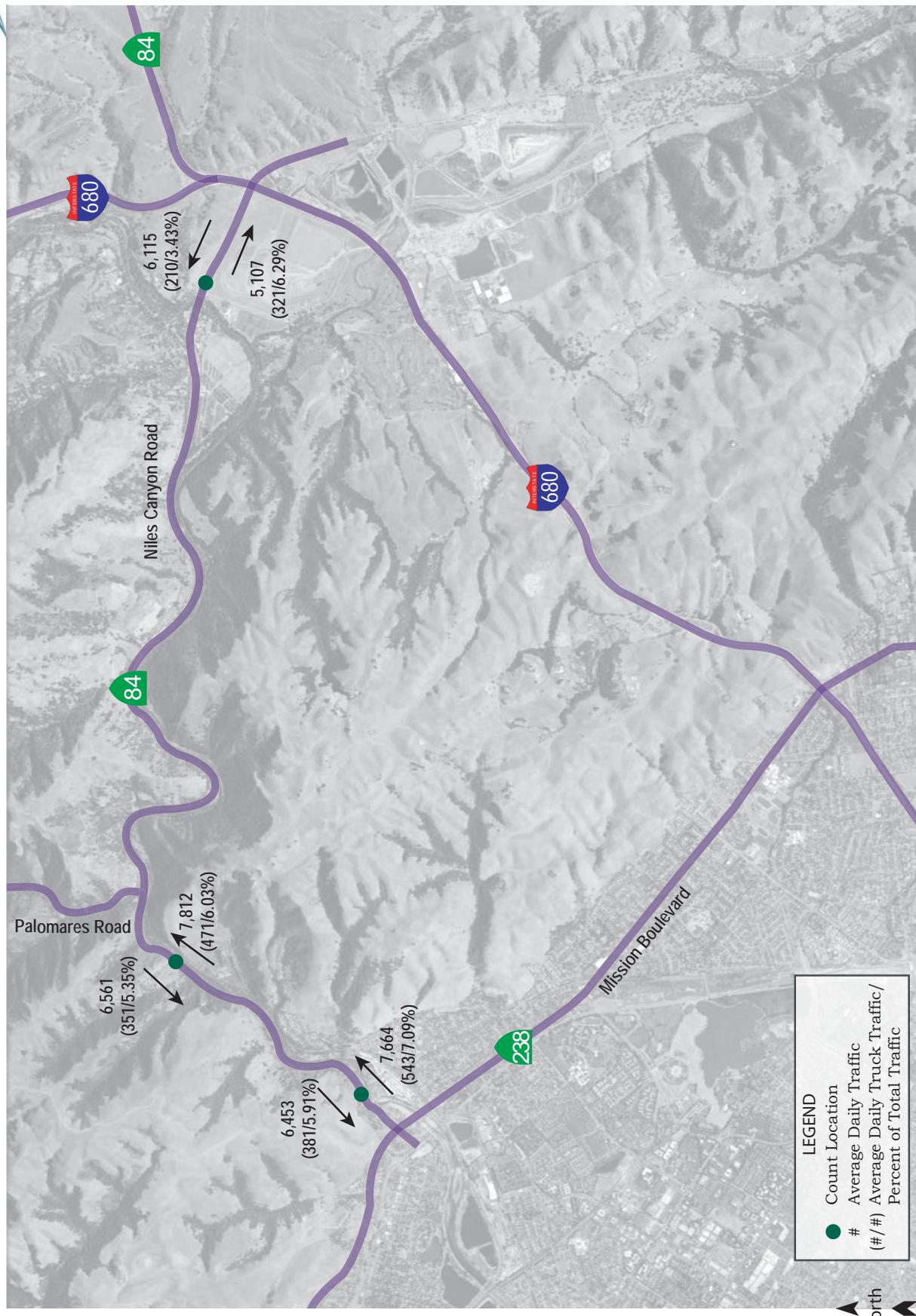


Figure 2
Existing Traffic

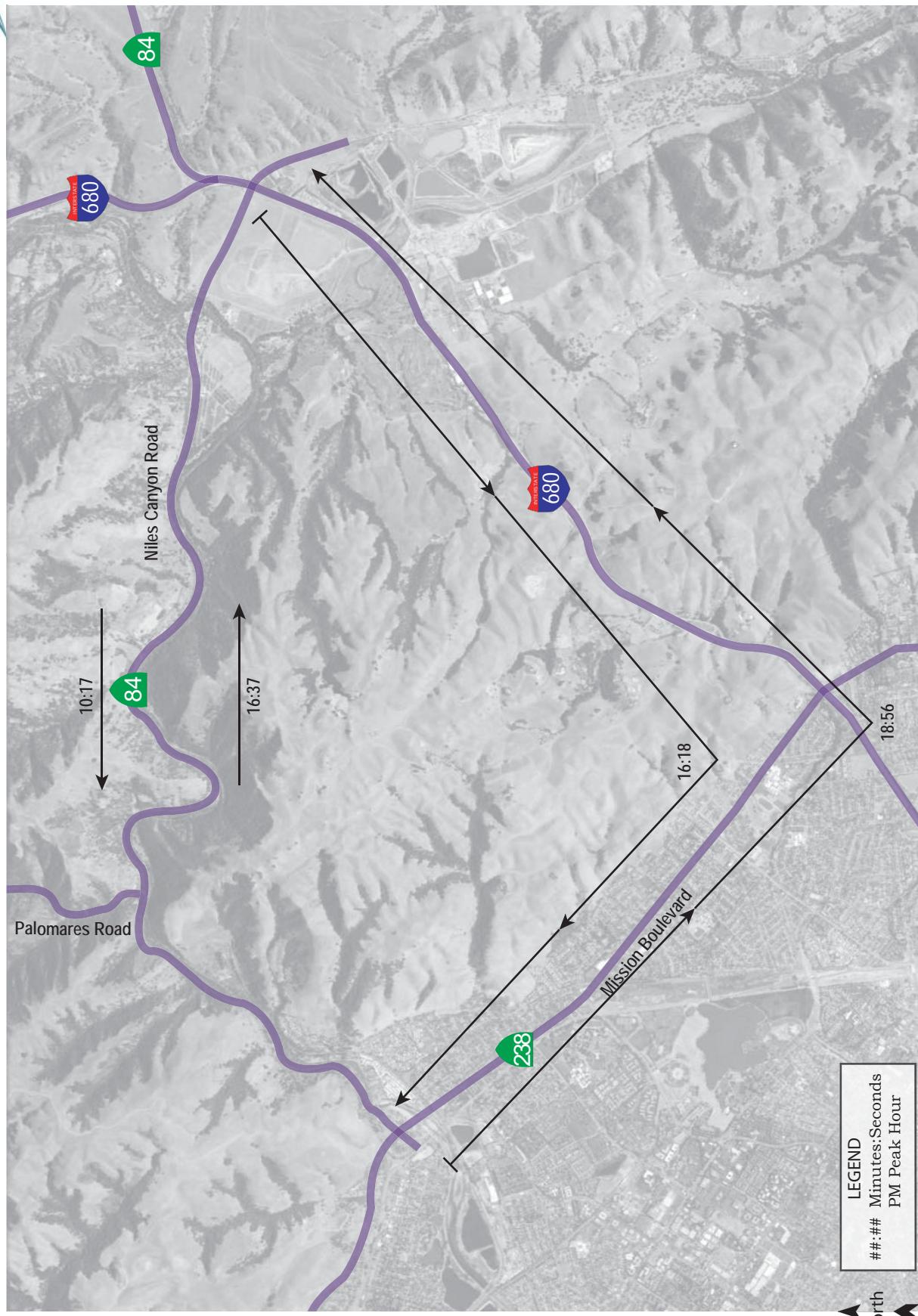
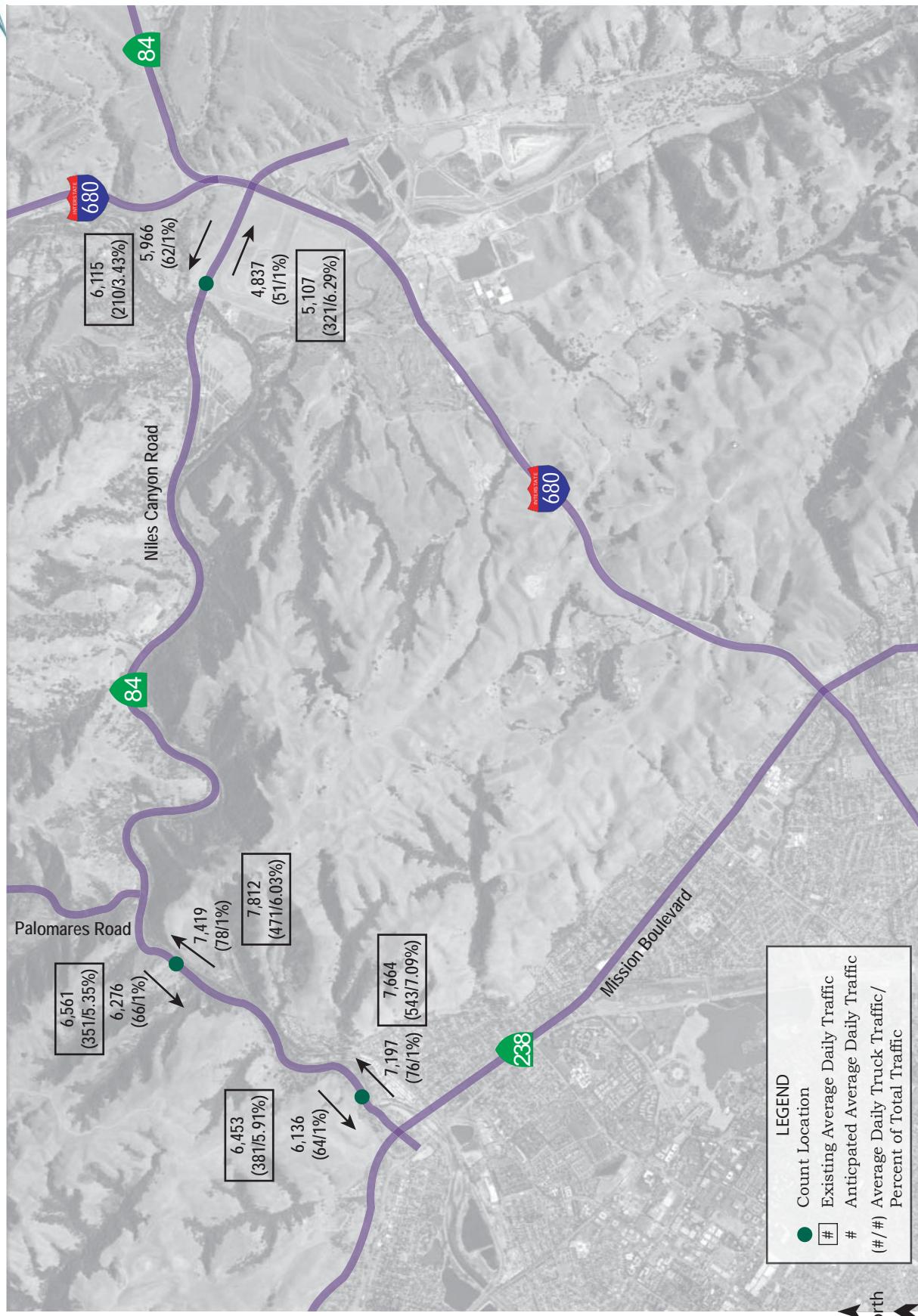


Figure 3
Alternative Route Travel Time
Niles Canyon Road (State Route 84) Truck Restriction Study
City of Fremont

**Figure 4**

Niles Canyon Road (State Route 84) Truck Restriction Study
Anticipated Average Daily Traffic with Truck Restriction
City of Fremont

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst or Company	EED West Cypress Rd-SR 64	Project No./Company	Established Wila Cypress Rd-SR 64
Date Performed	10/17/2011	Jurisdiction	east of Mission Blvd
Analysis Time Period	AM Peak Hour	City of Fremont	City of Fremont
Project Description:		Analysis Year	2011
Input Data			
Segment length, L_s	mi	Lane width, t_s	ft
Shoulder width, t_{sh}	ft	Lane width, t_l	ft
Lane width, t_l	ft	Shoulder width, t_{sh}	ft
Segment length, L_s	mi	Segment length, L_s	mi
Analysis direction vol., V_d	102/veh/h	Analysis direction vol., V_d	102/veh/h
Opposing direction vol., V_o	36/veh/h	Opposing direction vol., V_o	36/veh/h
Shoulder width, t_{sh}	0.0 ft	Shoulder width, t_{sh}	0.0 ft
Lane width, t_l	12.0 ft	Lane width, t_l	12.0 ft
Segment Length, L_s	6.5 mi	Segment Length, L_s	6.5 mi
Average Travel Speed		Opposing Direction (o)	
Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)		Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)	1.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)		Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1
Heavy-vehicle adjustment factor, $f_{hv,ATS} = 1/(1 + P_t(E_t - 1) + P_o(E_o - 1))$		Heavy-vehicle adjustment factor, $f_{hv,ATS} = 1/(1 + P_t(E_t - 1) + P_o(E_o - 1))$	0.947
Grade adjustment factor, $f_{g,ATS}$ (Exhibit 15-9)		Grade adjustment factor, $f_{g,ATS}$ (Exhibit 15-9)	1.00
Demand for rate, $v/(pcn)/(P_t^2 * f_{hv,ATS}^2 * f_{g,ATS}^2)$		Demand for rate, $v/(pcn)/(P_t^2 * f_{hv,ATS}^2 * f_{g,ATS}^2)$	11.68
Estimated Free-Flow Speed		Opposing Direction (o)	
Mean speed of sample ^a , S_{ATs}	1.3	Mean speed of sample ^a , S_{ATs}	1.3
Total demand for rate, both directions, v	1.1	Total demand for rate, both directions, v	1.1
Adj. for access points ^b , $f_{ap,ATS}$ (Exhibit 15-8)	0.940	Adj. for access points ^b , $f_{ap,ATS}$ (Exhibit 15-8)	0.940
Free-flow speed, FFS _d	0.976	Free-flow speed, FFS _d	0.976
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.00	Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.00
Demand for rate, $v/(pcn)/(P_t^2 * f_{hv,ATS}^2 * f_{g,ATS}^2)$	0.95	Demand for rate, $v/(pcn)/(P_t^2 * f_{hv,ATS}^2 * f_{g,ATS}^2)$	0.95
Average travel speed, $A ATS = FFS_d * 0.00776/v(f_{ap,ATS} * f_{np,ATS})$	10.94 mi	Average travel speed, $A ATS = FFS_d * 0.00776/v(f_{ap,ATS} * f_{np,ATS})$	10.94 mi
Estimated Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Base free-flow speed ^c , BFFS	50.0 mph	Base free-flow speed ^c , BFFS	50.0 mph
Adj. for lane and shoulder width, f_{ls} (Exhibit 15-7)	2.6 mph	Adj. for lane and shoulder width, f_{ls} (Exhibit 15-7)	2.6 mph
Adj. for access points ^d , $f_{ap,ATS}$ (Exhibit 15-8)	0.5 mph	Adj. for access points ^d , $f_{ap,ATS}$ (Exhibit 15-8)	0.5 mph
Free-flow speed, FFS _d	46.9 mph	Free-flow speed, FFS _d	46.9 mph
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	33.4 mph	Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	31.8 mph
Percent Time-Spent-Following		Opposing Direction (o)	
Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)		Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)	1.4
Passenger-car equivalents for RVs, E_R (Exhibit 15-8 or 15-19)		Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0
Heavy-vehicle adjustment factor, $f_{hv,TSF}$ (Exhibit 15-16 or Ex 15-17)		Heavy-vehicle adjustment factor, $f_{hv,TSF}$ (Exhibit 15-16 or Ex 15-17)	1.00
Grade adjustment factor, $f_{g,TSF}$ (Exhibit 15-16 or Ex 15-17)		Grade adjustment factor, $f_{g,TSF}$ (Exhibit 15-16 or Ex 15-17)	0.9277
Directional flow rate ^e , $v/(pcn)/(P_t^2 * f_{hv,TSF}^2 * f_{g,TSF}^2)$		Directional flow rate ^e , $v/(pcn)/(P_t^2 * f_{hv,TSF}^2 * f_{g,TSF}^2)$	1.00
Base percent time spent following ^f , BPF _d		Base percent time spent following ^f , BPF _d	11.34
Adj. for no-passing zones, $f_{np,TSF}$ (Exhibit 15-21)		Adj. for no-passing zones, $f_{np,TSF}$ (Exhibit 15-21)	77.5
Percent time spent following, PTF _d	20.9	Percent time spent following, PTF _d	11.34
Level of Service and Other Performance Measures		Level of Service and Other Performance Measures	1.00
Level of service, LOS (Exhibit 15-3)		Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c		Volume to capacity ratio, v/c	0.72
Capacity, C _d ATS (Equation 15-12) p/h		Capacity, C _d ATS (Equation 15-12) p/h	0
Capacity, C _d PTS (Equation 15-3) p/h		Capacity, C _d PTS (Equation 15-3) p/h	1577
Percent free-flow speed, PFF _d		Percent free-flow speed, PFF _d	67.8
Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h		Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h	1134.4
Effective width, W _d (Eq. 15-29) ft		Effective width, W _d (Eq. 15-29) ft	15.00
Effective speed factor, S _d (Eq. 15-30)		Effective speed factor, S _d (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)		Bicycle level of service score, BLOS (Eq. 15-31)	5.61
Bicycle level of service score (Exhibit 15-4)		Bicycle level of service score (Exhibit 15-4)	F
Notes		Notes	
1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.		1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.	
2. If $(V_{OL} \text{ or } V_d) >= 1700$ pcfh, terminate analysis—the LOS is F.		2. If $(V_{OL} \text{ or } V_d) >= 1700$ pcfh, terminate analysis—the LOS is F.	
3. For the analysis direction only and for >200 veh/h.		3. For the analysis direction only and for >200 veh/h.	
4. For the analysis direction only		4. For the analysis direction only	
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.		5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.	
6. Use alternative Exhibit 15-14 if some factors depend on a raw score on a specific downgrade.		6. Use alternative Exhibit 15-14 if some factors depend on a raw score on a specific downgrade.	

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DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information		Site Information	
Analysis For Company	WB Nine County Rd-SR 64	Region / Direction of Travel	WB Nine County Rd-SR 64	WB Nine County Rd-SR 64	east of Mission Blvd
Date Performed	10/17/2011	Jurisdiction	City of Fremont	City of Fremont	City of Fremont
Analysis Time Period	AM Peak Hour	Project Description:	2011	Project Description:	Analysis Year
Project Description:					
Input Data					
Segment length, l_s	4 mi	Lane width	12 ft	Shoulder width, l_t	0 ft
Segment length, l_a	4 mi	Lane width	12 ft	Lane width	12 ft
Analysis direction vol., V_d	96 Aveh/h	Shoulder width, l_s	0 ft	Shoulder width, l_t	0 ft
Opposite direction vol., V_o	39 Aveh/h	Segment length, l_s	4 mi	Segment length, l_t	0 ft
Shoulder width, l_t	0 ft	Analysis direction vol., V_d	96 Aveh/h	Terrain	0
Lane Width, l_w	12 ft	Opposite direction vol., V_o	39 Aveh/h	Grade Length, l_g	0 mi
Segment Length, l_s	4 mi	Segment Length, l_s	4 mi	Grade	0
Average Travel Speed		Analysis direction vol., V_d	96 Aveh/h	Peak-hour factor, P_{PH}	0.90
Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)		Opposing direction vol., V_o	39 Aveh/h	Peak-hour factor, P_{PH}	1.00
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)		Segment length, l_s	4 mi	Non-passing zone, l_n	0.00
Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)	0.981	Analysis direction vol., V_d	96 Aveh/h	% Trucks and Buses, P_T	6%
Grade adjustment factor, f_g (ATS) (Exhibit 15-9)	1.00	Opposing direction vol., V_o	39 Aveh/h	% Recreational vehicles, P_R	1%
Demand for rate, v_d (pcd/h) $\times v_o$ / ($P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s$)	109.1	Shoulder width, l_t	0 ft	Access points, P_A	2/mi
Analysis Direction (d)		Opposing Direction (o)		Analysis Direction (d)	
Passenger-car equivalents for trucks, E_t (Exhibit 15-11 or 15-12)		Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)		Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)	1.9
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)		Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)		Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1
Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)	0.981	Grade adjustment factor, f_g (ATS) (Exhibit 15-9)		Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)	0.948
Grade adjustment factor, f_g (ATS) (Exhibit 15-9)	1.00	Demand for rate, v_d (pcd/h) $\times v_o$ / ($P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s$)		Grade adjustment factor, f_g (ATS) (Exhibit 15-9)	0.91
Demand for rate, v_d (pcd/h) $\times v_o$ / ($P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s$)	109.1	Average travel speed, V_d	96 Aveh/h	Demand for rate, v_d (pcd/h) $\times v_o$ / ($P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s$)	115.6
Estimated Free-Flow Speed		Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample ^a , S_{MM}		Mean speed of sample ^a , S_{MM}		Base free-flow speed ^d , BFFS	50.0 mph
Total demand flow rate, both directions, v		Total demand flow rate, both directions, v		Adj. for lane and shoulder width, f_s (Exhibit 15-7)	2.6 mph
Free-flow speed, FFS = $S_{MM} \times 0.00776 \cdot f_s \cdot f_{ATS}$		Free-flow speed, FFS = $S_{MM} \times 0.00776 \cdot f_s \cdot f_{ATS}$		Adj. for access points ^a , f_a (Exhibit 15-8)	0.5 mph
Adj. for no-passing zones, f_{nPS} (Exhibit 15-15)		Adj. for no-passing zones, f_{nPS} (Exhibit 15-15)		Free-flow speed, FFS = $BFFS \cdot f_{ATS} \cdot f_{nPS}$	46.9 mph
Percent Time-Spent Following		Percent Time-Spent Following		Percent Time-Spent Following	
Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)		Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)		Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)		Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)		Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0
Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)		Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)		Heavy-vehicle adjustment factor, f_{HV} ($P_d + 1 - P_o$) ($E_t + E_R - 1$)	1.00
Grade adjustment factor, f_g (ATS) (Exhibit 15-17)		Grade adjustment factor, f_g (ATS) (Exhibit 15-17)		Grade adjustment factor, f_g (ATS) (Exhibit 15-17)	0.977
Directional flow rate, v/d (pcd/h) $\times v_o / (P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s)$		Directional flow rate, v/d (pcd/h) $\times v_o / (P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s)$		Directional flow rate, v/d (pcd/h) $\times v_o / (P_{PH} \cdot f_{ATS} \cdot f_g \cdot l_s)$	0.92
Base percent time-spent following ^b , BPSF (%) = $100 \cdot (v/d)^{1/2}$		Base percent time-spent following ^b , BPSF (%) = $100 \cdot (v/d)^{1/2}$		Base percent time-spent following ^b , BPSF (%) = $100 \cdot (v/d)^{1/2}$	47.6
Adj. for no-passing zones, f_{nPS} (Exhibit 15-21)		Adj. for no-passing zones, f_{nPS} (Exhibit 15-21)		Adj. for no-passing zones, f_{nPS} (Exhibit 15-21)	57.1
Percent time-spent following, PPSF (%) = $BPSF \cdot f_g \cdot f_s \cdot f_{ATS} \cdot f_{nPS} \cdot (V_d / V_o)^{1/2}$		Percent time-spent following, PPSF (%) = $BPSF \cdot f_g \cdot f_s \cdot f_{ATS} \cdot f_{nPS} \cdot (V_d / V_o)^{1/2}$		Percent time-spent following, PPSF (%) = $BPSF \cdot f_g \cdot f_s \cdot f_{ATS} \cdot f_{nPS} \cdot (V_d / V_o)^{1/2}$	20.9
Level of Service and Other Performance Measures		Level of service, LOS (Exhibit 15-3)		Level of service, LOS (Exhibit 15-3)	
Volume to capacity ratio, v/c	0.68	Volume to capacity ratio, v/c	0.67	Volume to capacity ratio, v/c	0.67
Capacity, C_{ATS} (Equation 15-12) p/cph	0	Capacity, C_{ATS} (Equation 15-12) p/cph	0	Capacity, C_{ATS} (Equation 15-12) p/cph	16168
Capacity, C_{PPSF} (Equation 15-3) p/cph	1577	Capacity, C_{PPSF} (Equation 15-3) p/cph	1700	Capacity, C_{PPSF} (Equation 15-3) p/cph	1700
Percent Free-Flow Speed, PFFS (%) = $BPSF \cdot f_g \cdot f_s \cdot f_{ATS} \cdot f_{nPS} \cdot (V_d / V_o)^{1/2}$		Percent Free-Flow Speed, PFFS (%) = $BPSF \cdot f_g \cdot f_s \cdot f_{ATS} \cdot f_{nPS} \cdot (V_d / V_o)^{1/2}$		Percent Free-Flow Speed, PFFS (%) = $BPSF \cdot f_g \cdot f_s \cdot f_{ATS} \cdot f_{nPS} \cdot (V_d / V_o)^{1/2}$	70.5
Bicycle Level of Service		C		C	
Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h	1070.0	Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h	1070.0	Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h	1070.0
Effective width, W_e (Eq. 15-29) ft	15.00	Effective width, W_e (Eq. 15-29) ft	15.00	Effective width, W_e (Eq. 15-29) ft	15.00
Effective speed factor, S_e (Eq. 15-30)	4.42	Effective speed factor, S_e (Eq. 15-30)	4.42	Effective speed factor, S_e (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	5.58	Bicycle level of service score, BLOS (Eq. 15-31)	5.58	Bicycle level of service score, BLOS (Eq. 15-31)	5.58
Bicycle level of service score v_c (Exhibit 15-4)	E	Bicycle level of service score v_c (Exhibit 15-4)	E	Bicycle level of service score v_c (Exhibit 15-4)	E
Notes		Notes		Notes	
1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.		1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.		1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.	
2. If $(V_d + V_o) >= 1700$ pcd, terminate analysis—the LOS is F.		2. If $(V_d + V_o) >= 1700$ pcd, terminate analysis—the LOS is F.		2. If $(V_d + V_o) >= 1700$ pcd, terminate analysis—the LOS is F.	
3. For the analysis direction only and $v > 200$ veh.		3. For the analysis direction only and $v > 200$ veh.		3. For the analysis direction only and $v > 200$ veh.	
4. For the analysis direction only		4. For the analysis direction only		4. For the analysis direction only	
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.		5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.		5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.	
6. Use alternative Exhibit 15-14 if some factors depend on a specific downgrade.		6. Use alternative Exhibit 15-14 if some factors depend on a specific downgrade.		6. Use alternative Exhibit 15-14 if some factors depend on a specific downgrade.	

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Directional

Directional

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET					
General Information			DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET		
Analyst or Company Data Source Analysis Time Period Project Description:	Site Information Highway / Direction of Travel Highway To Analysis Year		WB Miles Canyon Rd-SR 84 Segment C of front 2011		
Analyst or Company Data Source Analysis Time Period Project Description:	Input Data		Input Data		
<p>Analysis direction, V_d Opposing travel, V_o Shoulder width if it Same width as, v_m Shoulder width if it Same width as, v_m Opposing travel, V_o No-passing zone, P_{NP} % Trucks and Buses, P_T % Recreational vehicles, P_R Access points, m</p>		<p>Analysis direction vol., V_d Opposing travel vol., V_o Shoulder width if it Same width as, v_m Opposing travel, V_o No-passing zone, P_{NP} % Trucks and Buses, P_T % Recreational vehicles, P_R Access points, m</p>		<p>Analysis direction, V_d Opposing travel, V_o Shoulder width if it Same width as, v_m Opposing travel, V_o No-passing zone, P_{NP} % Trucks and Buses, P_T % Recreational vehicles, P_R Access points, m</p>	
Average Travel Speed		Estimated Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Passenger-car equivalents for trucks, E_t (Exhibit 15-11 or 15-12) Passenger-car equivalents for RVs, E_r (Exhibit 15-11 or 15-13) Heavy-vehicle adjustment factor, f_{HVSATs} * $(1 + P_f(E_r - 1)P_r(E_R - 1))$ Grade adjustment factor ¹ , f_{GATs} (Exhibit 15-9) Demand flow rate ² , v_m (phh) * V_d/V_o * $(P_{HFS} * f_{HFSATs} * f_{VdATs})$		Mean speed of sample ³ , S_{M4} Adj. for access points, f_A (Exhibit 15-7) Free-flow speed, FFS (FFS-BFFS * f_{L5}) Average travel speed, $AATS$ (FFS-BFFS-0.00778VdATs * V_o * $AATS$) * $f_{v_o AATS}$		Base free-flow speed ⁴ , BFFS Adj. for lane and shoulder width, f_L (Exhibit 15-7) Adj. for access points ⁵ , f_A (Exhibit 15-8) Free-flow speed, FFS (FFS-BFFS * f_{L5}) Adj. for no-passing zones, f_{NPATs} (Exhibit 15-15)	
Percent Time-Spent-Following		Estimated Free-Flow Speed		Estimated Free-Flow Speed	
Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19) Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19) Heavy-vehicle adjustment factor, f_{HVSATs} * $(1 + P_f(E_r - 1)P_r(E_R - 1))$ Grade adjustment factor ¹ , f_{GATs} (Exhibit 15-16 or 15-17) Directional flow rate ² , v_m (phh) * V_d/V_o * $(P_{HFS} * f_{HFSATs} * f_{VdATs})$ Base percent time-spent-following ⁴ , $BPFST_{d,0}$ (%) = $100(1 - \alpha^{n-1})$ Adj. for no-passing zones, f_{NPATs} (Exhibit 15-21) Percent time-spent-following, $BPFST_d$ (%) = $BPFST_{d,0} * f_{NPATs} * f_{VdATs} * v_o * P_{HFS}$		Mean speed of sample ³ , S_{M4} Total demand flow rate, both directions, v Free-flow speed, FFS = $\frac{FFS}{0.00778VdATs * V_o * AATS}$ Adj. for no-passing zones, f_{NPATs} (Exhibit 15-15)		Base free-flow speed ⁴ , BFFS Adj. for lane and shoulder width, f_L (Exhibit 15-7) Adj. for access points ⁵ , f_A (Exhibit 15-8) Free-flow speed, FFS (FFS-BFFS * f_{L5}) Adj. for no-passing zones, f_{NPATs} (Exhibit 15-15)	
Percent Time-Spent-Following		Analysis Direction (d)		Analysis Direction (d)	
Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19) Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19) Heavy-vehicle adjustment factor, f_{HVSATs} * $(1 + P_f(E_r - 1)P_r(E_R - 1))$ Grade adjustment factor ¹ , f_{GATs} (Exhibit 15-16 or 15-17) Directional flow rate ² , v_m (phh) * V_d/V_o * $(P_{HFS} * f_{HFSATs} * f_{VdATs})$ Base percent time-spent-following ⁴ , $BPFST_{d,0}$ (%) = $100(1 - \alpha^{n-1})$ Adj. for no-passing zones, f_{NPATs} (Exhibit 15-21) Percent time-spent-following, $BPFST_d$ (%) = $BPFST_{d,0} * f_{NPATs} * f_{VdATs} * v_o * P_{HFS}$		Analysis Direction (d) Opposing Direction (o) 1.9 1.1 0.98 1.00 1.02 1.03 1.3		Analysis Direction (d) Opposing Direction (o) 1.9 1.1 0.956 0.93 0.91 5.15 1.3	
Level of Service and Other Performance Measures		Bicycle Level of Service		Bicycle Level of Service	
Level of service, LOS (Exhibit 15-3) Volume to capacity ratio, v/c Effective width, W (Eq. 15-29 ft) Effective speed factor, S_j (Eq. 15-30) Bicycle level of service score, BLOS (Eq. 15-31) Bicycle level of service (Exhibit 15-4)		Level of service, LOS (Exhibit 15-3) Volume to capacity ratio, v/c Effective width, W (Eq. 15-29 ft) Effective speed factor, S_j (Eq. 15-30) Bicycle level of service score, BLOS (Eq. 15-31) Bicycle level of service (Exhibit 15-4)		Level of service, LOS (Exhibit 15-3) Volume to capacity ratio, v/c Effective width, W (Eq. 15-29 ft) Effective speed factor, S_j (Eq. 15-30) Bicycle level of service score, BLOS (Eq. 15-31) Bicycle level of service (Exhibit 15-4)	
Notes		Notes		Notes	
¹ Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.		² If $v_m/v_o > 1.70$, pch, terminate analysis—the LOS is F.		³ If $v_m/v_o > 1.00$, the analysis continues only and for >200 veh/h.	
⁴ For the first 15-18, if the adjustment factor is greater than 1.00, it provides coefficients a and b for Equation 15-10.		⁵ Exhibit 15-24 provides coefficients a and b for Equation 15-10.		⁶ Use alternative Exhibit 15-14 if some trucks operate at a crawl speeds on a specific downgrade.	
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DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analysis Company	TEB	Project No.	West Orange Bay SR 44
Date Performed	W/Trans 10/17/2011 AM Peak Hour	Region / Direction of Travel	west of Poinsett Road City of Fremont
Analysis Time Period	2011	Project Description:	
Project Description:			
Input Data			
Segment length, l_s	4 mi	Shoulder width, h_s	0 ft
Lane width, h_l	12 ft	Lane width, h_l	12 ft
Shoulder width, h_s	0 ft	Shoulder width, h_s	0 ft
Segment length, l_s	4 mi	Segment length, l_s	4 mi
Analysis direction vol., V_d	32kveh/h	Analysis direction vol., V_d	55kveh/h
Opposing direction vol., V_o	62kveh/h	Opposing direction vol., V_o	52kveh/h
Shoulder width, h_s	0 ft	Shoulder width, h_s	0 ft
Lane width, h_l	12.0 ft	Lane width, h_l	12.0 ft
Segment Length, l_s	6.5 mi	Segment Length, l_s	6.5 mi
Average Travel Speed		Average Travel Speed	
Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)		Opposing Direction (o)	
Passenger-car equivalents for RVs, E_r (Exhibit 15-11 or 15-13)		Passenger-car equivalents for RVs, E_r (Exhibit 15-11 or 15-13)	1.7
Heavy-vehicle adjustment factor, f_{HVS} ($1 + P_f(E_t - 1) + P_r(E_r - 1)$)	0.943	Heavy-vehicle adjustment factor, f_{HVS} ($1 + P_f(E_t - 1) + P_r(E_r - 1)$)	1.1
Grade adjustment factor, f_g (ATS Exhibit 15-9)	0.87	Grade adjustment factor, f_g (ATS Exhibit 15-9)	0.959
Demand for rate, $v/(pcbf)^{1/2}/(Pf^2 f_g^2 ATs^{1/2})$	0.39	Demand for rate, $v/(pcbf)^{1/2}/(Pf^2 f_g^2 ATs^{1/2})$	0.97
Mean speed of sample ^a , S_M		Free-Flow speed from Field Measurement	
Total demand flow rate, both directions, v		Mean speed of sample ^a , S_M	50.0 mph
Free-Flow speed, FFS _d ($FFS_d = S_M * (1 + 0.00776v / h_s ATs)$)	1.4 mph	Total demand flow rate, both directions, v (Exhibit 15-7)	50.0 mph
Adj. for no-passing zones, f_{NPS} (Exhibit 15-15)		Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19)	2.6 mph
Estimated Free-Flow Speed		Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19)	2.6 mph
Base free-flow speed ^a , BFFS		Heavy-vehicle adjustment factor, f_{HVS} ($1 + P_f(E_t - 1) + P_r(E_r - 1)$)	0.5 mph
Adj. for lane and shoulder width, f_{LS} (Exhibit 15-7)	1.6	Grade adjustment factor, f_g ($(1 + P_f(E_t - 1))^2 f_g ATs^{1/2}$)	46.9 mph
Adj. for access points ^a , f_{AP} (Exhibit 15-8)	1.1	Free-flow speed, FFS _d ($S_M * (1 + 0.00776v / h_s ATs)$)	46.9 mph
Free-Flow speed, FFS _d ($FFS_d = S_M * (1 + 0.00776v / h_s ATs)$)	0.943	Adj. for no-passing zones, f_{NPS} (Exhibit 15-15)	35.0 mph
Average travel speed, $AATs = FFS_d * 0.00776v / h_s ATs^{1/2} - f_{NPS} ATs$	0.943	Percent Time-Spent-Following	
Mean speed of sample ^a , S_M		Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)	
Total demand flow rate, both directions, v		Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19)	
Free-Flow speed, FFS _d ($FFS_d = S_M * (1 + 0.00776v / h_s ATs)$)	1.4 mph	Heavy-vehicle adjustment factor, f_{HVS} ($1 + P_f(E_t - 1) + P_r(E_r - 1)$)	
Adj. for no-passing zones, f_{NPS} (Exhibit 15-15)		Grade adjustment factor, f_g ($(1 + P_f(E_t - 1))^2 f_g ATs^{1/2}$)	
Percent Time-Spent-Following		Free-flow speed, FFS _d ($S_M * (1 + 0.00776v / h_s ATs)$)	
Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)		Base percent time spent following ^b , BPSF _d (%)($100/(1 + e^{-d})$)	
Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19)		Adj. for no-passing zone, f_{NPS} (Exhibit 15-21)	
Heavy-vehicle adjustment factor, f_{HVS} ($1 + P_f(E_t - 1) + P_r(E_r - 1)$)	1.0	Percent time spent following, $PTSF_d$ (%)($= PTSF_d + npf * V_o ATs^{1/2}$)	77.2
Grade adjustment factor, f_g ($(1 + P_f(E_t - 1))^2 f_g ATs^{1/2}$)	1.0	Level of Service and Other Performance Measures	
Directional flow rate, $v/(pcbf)^{1/2} / (Pf^2 f_g^2 ATs^{1/2})$	0.665	Level of service, LOS (Exhibit 15-3)	
Base percent time spent following ^b , BPSF _d (%)($100/(1 + e^{-d})$)	0.89	Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) / vfh	
Adj. for no-passing zones, f_{NPS} (Exhibit 15-21)	0.68	Effective width, Wv (Eq. 15-29) ft	72.6
Percent time spent following, PTSF _d (%)($= PTSF_d + npf * V_o ATs^{1/2}$)	0.77	Capacity, C_{ATs} (Equation 15-12) / vph	0
Level of Service and Other Performance Measures		Capacity, C_{ATs} (Equation 15-12) / vph	0
Volume to capacity ratio, v/c	0.41	Bicycle level of service score, BLOS (Eq. 15-31)	4.42
Capacity, C_{ATs} (Equation 15-12) / vph	1606	Bicycle level of service (Exhibit 15-4)	5.31
Capacity, C_{ATs} (Equation 15-12) / vph	1683	Bicycle level of service (Exhibit 15-4)	E
Bicycle level of service score, BLOS (Eq. 15-31)	5.03	Notes	
Bicycle level of service (Exhibit 15-4)	5.03	1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.	
Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) / vfh	360.0	2. If (V_o / V_d) or (V_o / V_o) >= 1/700, perform terminal analysis—the LOS is F.	
Effective width, Wv (Eq. 15-29) ft	15.00	3. For the analysis direction only and $v < 200$ vph.	
Effective speed factor, S_j (Eq. 15-30)	4.42	4. For the analysis direction only.	
Bicycle level of service score, BLOS (Eq. 15-31)	5.31	5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.	
Bicycle level of service (Exhibit 15-4)	5.31	6. Use alternative Exhibit 15-14 if some nodes depend on crw speeds on a specific downgrade.	

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Directional

Directional

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET	
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET	
General Information	Site Information WB Unp. Canyon Rd-SR 84 west of Canyon Rd City of Fremont 2011
Analyst or Company	TBD
Analyst or Company	WB Trans
Date Performed	10/7/2011
Analysis Time Period	AM Peak Hour
General Information	Site Information Primary Direction of Travel WB Trans Date Performed 10/7/2011 Analysis Year 2011
Analyst or Company	TBD
Analyst or Company	WB Trans
Date Performed	10/7/2011
Analysis Time Period	AM Peak Hour
General Information	Site Information Primary Direction of Travel WB Trans WB Unp. Canyon Rd-SR 84 west of Canyon Rd City of Fremont 2011
Analyst or Company	TBD
Analyst or Company	WB Trans
Date Performed	10/7/2011
Analysis Time Period	AM Peak Hour

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10/19/2011

file:///C:/Users/thenderson.W-TRANS/AppData/Local/Temp/s2kClC6.tmp

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET					
General Information			Site Information		
Agency or Company Analysis Time Period Project Description:	TDH W/trans MM Peak Hour	Highway / Direction of Travel From To Analyst Year	EB Niles Canyon Rd-SR 84 east of Mission Blvd Day or Night 2011 with Restriction	TDH W/trans MM Peak Hour	Highway / Direction of Travel From To Analyst Year
Input Data					
Key Data					
Average Travel Speed	<p>Analysis Direction (d)</p> <p>Opposing Direction (o)</p> <p>Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)</p> <p>Passenger-car equivalents for RVs, E_R (Exhibit 15-1 or 15-3)</p> <p>Heavy-vehicle adjustment factor, f_{HV} ($V_w/V_r = (1 + P_r)(E_r - 1) + P_r(E_r - 1)$)</p> <p>Grade adjustment factor^a, f_{GAT} (Exhibit 15-9)</p> <p>Demand flow rate^b, V_d ($P(HF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS})^2 \cdot V_w \cdot f_{ATS}$)</p> <p>Estimated Free-Flow Speed</p> <p>Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)</p> <p>Passenger-car equivalents for RVs, E_R (Exhibit 15-1 or 15-3)</p> <p>Heavy-vehicle adjustment factor, f_{HV} ($V_w/V_r = (1 + P_r)(E_r - 1) + P_r(E_r - 1)$)</p> <p>Grade adjustment factor^a, f_{GAT} (Exhibit 15-9)</p> <p>Demand flow rate^b, V_d ($P(HF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS})^2 \cdot V_w \cdot f_{ATS}$)</p> <p>Free-Flow Speed from Field Measurement</p> <p>Mean speed of sample^c, S_{FM}</p> <p>Total demand flow rate both directions, V</p> <p>Free-flow speed, $FFS = S_{FM} \cdot 0.00776(V_w \cdot f_{ATS})$</p> <p>Adj. for no-passing zones, f_{ATS} (Exhibit 15-9)</p> <p>Average travel speed, V_d ($P(HF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS})^2 \cdot V_w \cdot f_{ATS}$)</p> <p>Estimated Free-Flow Speed</p> <p>Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-2)</p> <p>Passenger-car equivalents for RVs, E_R (Exhibit 15-1 or 15-3)</p> <p>Heavy-vehicle adjustment factor, f_{HV} ($V_w/V_r = (1 + P_r)(E_r - 1) + P_r(E_r - 1)$)</p> <p>Grade adjustment factor^a, f_{GAT} (Exhibit 15-9 or Ex-15-17)</p> <p>Directional free-flow rate^d, V_d ($P(HF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS})^2 \cdot V_w \cdot f_{ATS}$)</p> <p>Base percent time spent following^e, f_{BTSF} (Exhibit 15-21)</p> <p>Adj. for no-passing zone, f_{ATS} (Exhibit 15-21)</p> <p>Percent time spent following^e, f_{TFS} ($\% \cdot BTSF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS}$)</p> <p>Percent Time-Spent-Following</p> <p>Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)</p> <p>Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)</p> <p>Heavy-vehicle adjustment factor, f_{HV} ($V_w/V_r = (1 + P_r)(E_r - 1) + P_r(E_r - 1)$)</p> <p>Grade adjustment factor^a, f_{GAT} (Exhibit 15-16 or Ex-15-7)</p> <p>Directional free-flow rate^d, V_d ($P(HF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS})^2 \cdot V_w \cdot f_{ATS}$)</p> <p>Base percent time spent following^e, f_{BTSF} ($\% \cdot f_{ATS}^{100(1-e^{BTSF})}$)</p> <p>Adj. for no-passing zone, f_{ATS} (Exhibit 15-21)</p> <p>Percent time spent following^e, f_{TFS} ($\% \cdot BTSF \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS} \cdot f_{ATS}$)</p> <p>Level of Service and Other Performance Measures</p> <p>Level of service, LOS (Exhibit 15-3)</p> <p>Volume to capacity ratio, v/c</p> <p>Capacity, C_{ATS} (Exhibit 15-12) pc/h</p> <p>Capacity, C_{ATS} (Equation 15-13) pc/h</p> <p>Percent Free-Flow Speed (FFS_d) (Equation 15-1 - Class III only)</p> <p>Bicycle Level of Service</p> <p>Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h</p> <p>Effective width, W (Eq. 15-29) ft</p> <p>Effective speed factor, S_v (Eq. 15-30)</p> <p>Bicycle level of service score, $BLOS$ (Eq. 15-31)</p> <p>Bicycle level of service (Exhibit 15-4)</p> <p>Notes</p> <p>1. Note that if the adjustment factor for level terrain is 1.00, no level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.</p> <p>2. If $(V_w/V_r)^2 > 1.700$ pc/h, terminate analysis—the LOS is F.</p> <p>3. For the analysis direction only, and for $v > 200$ veh/h.</p> <p>4. For the analysis direction only.</p> <p>5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.</p> <p>6. Use alternative Exhibit 15-14 if some lanes operate at travel speeds on a specific downgrade.</p>				
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DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

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DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Project Name	TDH Napa Canyon Rd-SR 64	Exhibit #/ Site Name	Exhibit #/ Highway
Agency or Company	Marin/Sonoma County	Region / Direction of Travel	Mid Segment
Date Performed	10/17/2011	Jurisdiction	City of Fremont
Analysis Time Period	AM Peak Hour	Analysis Year	2011 with Restriction
Project Description:			
Input Data		TDH WTrans 10/17/2011 AM Peak Hour	
Segment length, l_s	mi	Segment length, l_d	mi
Analysis direction vol., V_d	382veh/h	Analysis direction vol., V_o	396veh/h
Opposite direction vol., V_o	80veh/h	Opposite direction vol., V_d	102veh/h
Shoulder width, ft	12.0	Shoulder width, ft	12.0
Lane Width, ft	12.0	Lane Width, ft	12.0
Segment length, l_s	6.5	Segment length, l_d	6.5
Average Travel Speed		Average Travel Speed	
Analysis Direction (d)		Opposing Direction (o)	
Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-12)		Passenger-car equivalents for trucks, E_t (Exhibit 15-1 or 15-12)	1.3
Passenger-car equivalents for RVs, E_r (Exhibit 15-11 or 15-13)		Passenger-car equivalents for RVs, E_r (Exhibit 15-11 or 15-13)	1.1
Heavy-vehicle adjustment factor, $f_{hv,ATS} = 1/(1 + P_d(E_t - 1) + P_o(E_r - 1))$	0.989	Heavy-vehicle adjustment factor, $f_{hv,ATS} = 1/(1 + P_d(E_t - 1) + P_o(E_r - 1))$	0.986
Grade adjustment factor, $f_{g,ATS}$ (Exhibit 15-9)	0.91	Grade adjustment factor, $f_{g,ATS}$ (Exhibit 15-9)	1.00
Demand for rate, $v/(pcbf)^{1/2}/(PHE^2 f_{ATS}^{1/2} f_{g,ATS}^{1/2})$	472	Demand for rate, $v/(pcbf)^{1/2}/(PHE^2 f_{ATS}^{1/2} f_{g,ATS}^{1/2})$	1017
Mean speed of sample ^a , S_M		Mean speed of sample ^a , S_M	
Total demand flow, both directions, v		Total demand flow, both directions, v	
Free-flow speed, FFS _d (Exhibit 15-8)	1.1 mph	Free-flow speed, FFS _d (Exhibit 15-8)	1.1 mph
Adj. for access points, $f_{ap,ATS}$		Adj. for access points, $f_{ap,ATS}$	
Free-flow speed, FFS _d (0.00776/v _d) _{ATS}		Free-flow speed, FFS _d (0.00776/v _d) _{ATS}	2.4 mph
Percent Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Base free-flow speed ^a , BFFS	50.0 mph	Base free-flow speed ^a , BFFS	50.0 mph
Adj. for lane and shoulder width, $f_{ls,ATS}$ (Exhibit 15-7)	2.0	Adj. for lane and shoulder width, $f_{ls,ATS}$ (Exhibit 15-7)	1.3
Adj. for access points ^a , $f_{ap,ATS}$ (Exhibit 15-8)	1.1	Adj. for access points ^a , $f_{ap,ATS}$ (Exhibit 15-8)	1.1
Free-flow speed, FFS _d (0.00776/v _d) _{ATS}	0.989	Free-flow speed, FFS _d (0.00776/v _d) _{ATS}	0.986
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.0	Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.0
Percent Time-Spent-Following		Estimated Free-Flow Speed	
Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)		Passenger-car equivalents for trucks, E_t (Exhibit 15-18 or 15-19)	
Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19)		Passenger-car equivalents for RVs, E_r (Exhibit 15-18 or 15-19)	
Heavy-vehicle adjustment factor, $f_{hv,TSF} = 1/(1 + P_d(E_t - 1) + P_o(E_r - 1))$		Heavy-vehicle adjustment factor, $f_{hv,TSF} = 1/(1 + P_d(E_t - 1) + P_o(E_r - 1))$	
Grade adjustment factor, $f_{g,TSF}$ (Exhibit 15-16 or Ex 15-17)	0.996	Grade adjustment factor, $f_{g,TSF}$ (Exhibit 15-16 or Ex 15-17)	1.00
Directional flow rate, $v/(pcbf)^{1/2}(PHE^2 f_{ATS}^{1/2} f_{g,ATS}^{1/2})$	0.91	Directional flow rate, $v/(pcbf)^{1/2}(PHE^2 f_{ATS}^{1/2} f_{g,ATS}^{1/2})$	1.00
Base percent time-spent-following ^b , BPSF _d (%) = 100(1 - $e^{-v_d t_d}$) ^b	468	Base percent time-spent-following ^b , BPSF _d (%) = 100(1 - $e^{-v_d t_d}$) ^b	1139
Adj. for no-passing zones, $f_{np,TSF}$ (Exhibit 15-21)	55.1	Adj. for no-passing zones, $f_{np,TSF}$ (Exhibit 15-21)	77.4
Percent time-spent-following, PTSF _d (%) = BPSF _d (%) * $f_{np,TSF}^{1/2} \cdot v_d \cdot f_{ap,ATS}^{1/2} \cdot v_o \cdot f_{ap,ATS}^{1/2} \cdot v_d \cdot f_{ap,ATS}^{1/2}$	21.6	Percent time-spent-following, PTSF _d (%) = BPSF _d (%) * $f_{np,TSF}^{1/2} \cdot v_d \cdot f_{ap,ATS}^{1/2} \cdot v_o \cdot f_{ap,ATS}^{1/2} \cdot v_d \cdot f_{ap,ATS}^{1/2}$	20.9
Level of Service and Other Performance Measures		Level of Service and Other Performance Measures	
Level of service, LOS (Exhibit 15-3)	C	Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.59	Volume to capacity ratio, v/c	0.71
Capacity, C_{ATS} (Equation 15-12) p/h	1693	Capacity, C_{ATS} (Equation 15-12) p/h	0
Capacity, C_{pATS} (Equation 15-3) p/h	1719	Capacity, C_{pATS} (Equation 15-3) p/h	1609
Percent Free-Flow Speed, PFFS _d (Exhibit 15-1 - Class II only)	70.1	Percent Free-Flow Speed, PFFS _d (Exhibit 15-1 - Class II only)	66.1
Bicycle Level of Service		Bicycle Level of Service	
Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h	424.4	Directional demand flow rate in outside lane, V_{OL} (Eq. 15-24) veh/h	383.9
Effective width, W_e (Eq. 15-29) ft	15.00	Effective width, W_e (Eq. 15-29) ft	15.00
Effective speed factor, S_v (Eq. 15-30)	4.42	Effective speed factor, S_v (Eq. 15-30)	4.42
Bicycle level of service score, bLOS (Eq. 15-31)	3.66	Bicycle level of service score, bLOS (Eq. 15-31)	4.36
Bicycle level of service score (Exhibit 15-4)	D	Bicycle level of service score (Exhibit 15-4)	D
Notes		Notes	
1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.		1. Note that the adjustment factor for level terrain is 1.00 as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.	
2. If $(V_{OL} \text{ or } V_o) >= 1700$ pcfh, terminate analysis—the LOS is F.		2. If $(V_{OL} \text{ or } V_o) >= 1700$ pcfh, terminate analysis—the LOS is F.	
3. For the analysis direction only and for >200 veh/h.		3. For the analysis direction only and for >200 veh/h.	
4. For the analysis direction only		4. For the analysis direction only	
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.		5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.	
6. Use alternative Exhibit 15-4 if some factors depend on a raw score on a specific downgrade.		6. Use alternative Exhibit 15-4 if some factors depend on a raw score on a specific downgrade.	

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SEGMENT COLLISION RATE CALCULATIONS

City of Fremont

Location: SR 84 - Mission Boulevard to Interstate 680

Date of Count: Wednesday, September 14, 2011
ADT: 13,700

Number of Collisions: 399
Number of Injuries: 205
Number of Fatalities: 10
Start Date: January 1, 2000
End Date: December 31, 2009
Number of Years: 10.0

Highway Type: Conventional 2 lanes or less
Area: Rural
Design Speed: <=55
Terrain: Flat

Segment Length: 7.1 miles
Direction: East/West

NUMBER OF COLLISIONS x 1 MILLION

ADT x 365 DAYS PER YEAR x SEGMENT LENGTH x NUMBER OF YEARS

399	x	1,000,000			
13,700	x	365	x	7.142	x 10
Study Segment		Collision Rate	Fatality Rate	Injury Rate	
Statewide Average*		1.12 c/mvm	2.5%	51.4%	

ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* 2007 Collision Data on California State Highways, Caltrans

State Route 84 Collision Data - Provided by the City of Fremont

10-year	Collisions			Persons		Cross Into Opp. Lane	Ran-Off-Road	Head-On	Hit Object	Bicycle & Pedestrian related	Party_Type (All)	Party_Type (Truck related)	Party_Type (Truck related)	Truck related (PartyType / TotalCollisions)	Pickup_Panel		Truck w_Trailer		Truck_Tractor		Truck_Tractor&1-Trailer		Truck_Tractor&2-Trailer		Truck_Tractor&3-Trailer	
	Total	Fatal	Injury	Killed	Injured										(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)
Period	Total	Fatal	Injury	Killed	Injured	(%)	(%)	(%)	(%)	(%)	(No)	(%)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	
1999	57	1	33	1	49	8.8	14.0	10.5	33.3	0.0	83	28	33.7	49.1	21.0	36.8	1	1.8	2	3.5	4	7.0	0	0.0	0	0.0
2000	73	2	38	3	61	12.3	16.4	5.5	34.2	1.4	100	37	37.0	50.7	27.0	37.0	3	4.1	2	2.7	4	5.5	1	1.4	0	0.0
2001	50	2	20	2	34	12.0	6.0	6.0	48.0	2.0	64	17	26.6	34.0	12.0	24.0	0	0.0	1	2.0	4	8.0	0	0.0	0	0.0
2002	42	1	20	1	34	7.1	14.3	4.8	31.0	0.0	55	16	29.1	38.2	13.0	31.0	0	0.0	1	2.4	2	4.8	0	0.0	0	0.0
2003	46	0	21	0	31	15.2	6.5	17.4	30.4	0.0	58	10	17.2	21.8	7.0	15.2	1	2.2	0	0.0	1	2.2	1	2.2	0	0.0
2004	43	1	22	1	33	4.7	14.0	14.0	34.9	0.0	57	16	28.1	37.2	14.0	32.6	0	0.0	1	2.3	1	2.3	0	0.0	0	0.0
2005	31	1	16	1	26	9.7	16.1	22.5	32.3	6.5	40	12	30.0	38.7	11.0	35.5	0	0.0	0	0.0	0	0.0	1	3.2	0	0.0
2006	29	1	17	2	27	6.9	24.1	13.8	34.5	0.0	39	9	23.1	31.0	9.0	31.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2007	36	2	22	2	28	2.8	27.8	8.3	33.3	0.0	48	14	29.2	38.9	12.0	33.3	1	2.8	1	2.8	0	0.0	0	0.0	0	0.0
2008	29	0	17	0	19	6.9	44.8	0.0	51.7	6.9	37	8	21.6	27.6	8.0	27.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1999-2008	436	11	226	13	342	9.2	16.7	9.9	36.0	1.4	581	167	28.7	38.3	134	23.1	6	1.0	8	1.4	16	2.8	3	0.5	0	0.0
2009	20	0	12	0	18	5	20	5	25	0	31	7	35	7	35	0	0	0	0	0	0	0	0	0	0	0

Note: * Location of Collision Data: On Route 84 between Mission Blvd. and Route 680

Truck accident rate

State Route 84 Collision Data - Provided by the City of Fremont

10-year	Collisions			Persons		Cross Into Opp. Lane	Ran-Off-Road	Head-On	Hit Object	Bicycle & Pedestrian related	Party_Type (All)	Party_Type (Truck related)	Party_Type (Truck related)	Truck related (PartyType / TotalCollisions)	Pickup_Panel		Truck w_Trailer		Truck_Tractor		Truck_Tractor&1-Trailer		Truck_Tractor&2-Trailer		Truck_Tractor&3-Trailer	
	Total	Fatal	Injury	Killed	Injured	(%)	(%)	(%)	(%)	(%)	(No)	(%)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	
Period	Total	Fatal	Injury	Killed	Injured	(%)	(%)	(%)	(%)	(%)	(No)	(%)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	(No)	(%)	
1999	57	1	33	1	49	8.8	14.0	10.5	33.3	0.0	83	28	33.7	49.1	21.0	36.8	1	1.8	2	3.5	4	7.0	0	0.0	0	0.0
2000	73	2	38	3	61	12.3	16.4	5.5	34.2	1.4	100	37	37.0	50.7	27.0	37.0	3	4.1	2	2.7	4	5.5	1	1.4	0	0.0
2001	50	2	20	2	34	12.0	6.0	6.0	48.0	2.0	64	17	26.6	34.0	12.0	24.0	0	0.0	1	2.0	4	8.0	0	0.0	0	0.0
2002	42	1	20	1	34	7.1	14.3	4.8	31.0	0.0	55	16	29.1	38.2	13.0	31.0	0	0.0	1	2.4	2	4.8	0	0.0	0	0.0
2003	46	0	21	0	31	15.2	6.5	17.4	30.4	0.0	58	10	17.2	21.8	7.0	15.2	1	2.2	0	0.0	1	2.2	1	2.2	0	0.0
2004	43	1	22	1	33	4.7	14.0	14.0	34.9	0.0	57	16	28.1	37.2	14.0	32.6	0	0.0	1	2.3	1	2.3	0	0.0	0	0.0
2005	31	1	16	1	26	9.7	16.1	22.5	32.3	6.5	40	12	30.0	38.7	11.0	35.5	0	0.0	0	0.0	0	0.0	1	3.2	0	0.0
2006	29	1	17	2	27	6.9	24.1	13.8	34.5	0.0	39	9	23.1	31.0	9.0	31.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2007	36	2	22	2	28	2.8	27.8	8.3	33.3	0.0	48	14	29.2	38.9	12.0	33.3	1	2.8	1	2.8	0	0.0	0	0.0	0	0.0
2008	29	0	17	0	19	6.9	44.8	0.0	51.7	6.9	37	8	21.6	27.6	8.0	27.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1999-2008	436	11	226	13	342	9.2	16.7	9.9	36.0	1.4	581	167	28.7	38.3	134	23.1	6	1.0	8	1.4	16	2.8	3	0.5	0	0.0
2009	20	0	12	0	18	5	20	5	25	0	31	7	35	7	35	0	0	0	0	0	0	0	0	0	0	0

Note: * Location of Collision Data: On Route 84 between Mission Blvd. and Route 680

Truck accident rate



City of Fremont G.I.S. DIVISION
Office of Information Systems
39550 Library Street, P.O. Box 5006
Fremont, California 94537-5006

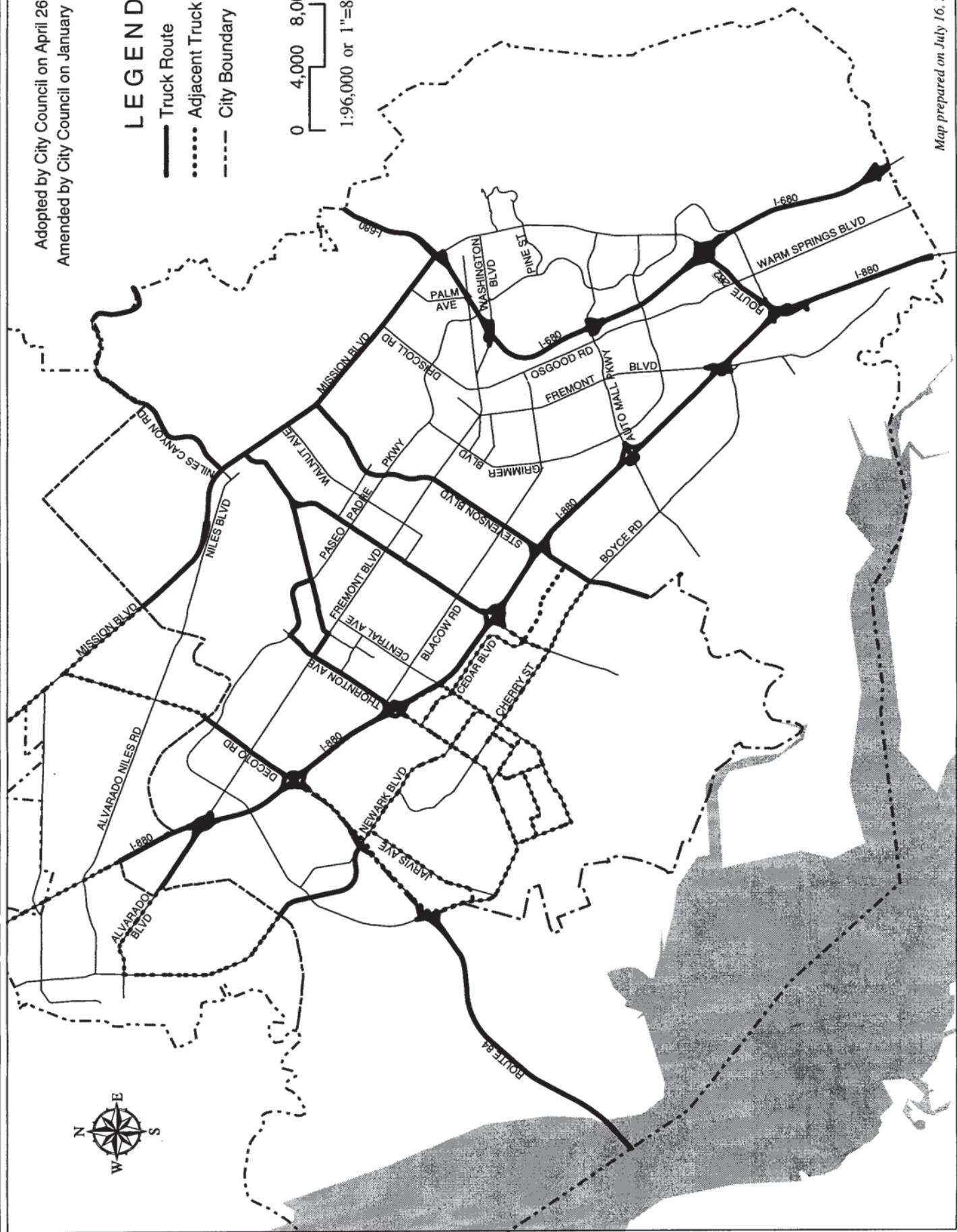
CITY OF FREMONT TRUCK ROUTES

Adopted by City Council on April 26, 1988.
Amended by City Council on January 11, 2000.

LEGEND

- Truck Route
- Adjacent Truck Route
- - - City Boundary

0 4,000 8,000
1:96,000 or 1"=8000'
Feet



Map prepared on July 16, 2004 by RChan

TRUCK NETWORKS

on

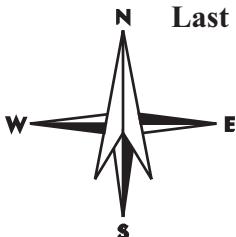
California State Highways

DISTRICT 4

Map 4 of 12

Not to scale

Last revised March 15, 2011



Rte 82 is black in San Francisco Co. from the SF/San Mateo County line (PM 0.0) to Jct Rte 280 (PM 0.2).

Smith Brothers Ln. just south of the Town of Bodega Bay PM 9.7

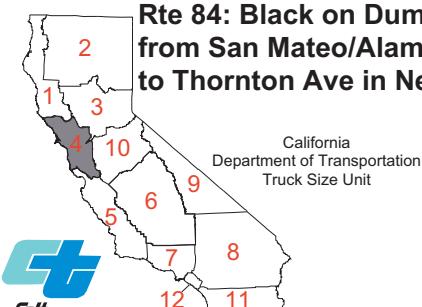
RESTRICTION
Rte 24: Caldicott Tunnel (PM ALA 5.9 to CC 0.3) No explosives, flammables, liquified petroleum gas, or poisonous gas in tank truck, trailer, or semitrailer except from 3 am to 5 am. Otherwise, is green route.

RESTRICTION: Rte 80, SF-Oakland Bay Bridge (PM SF 4.9 to ALA 2.2) No flammable tank vehicles or explosives. Otherwise, is green route.

RESTRICTION: Rte 260 from Central Ave. in Alameda (PM 0.6) to Jct 880 (PM 1.9) No trucks transporting hazardous materials/waste thru Webster & Posey Tunnels. Otherwise, is black route.

Frenchmans Creek Rd., PM 30.2
San Pedro Creek, PM 40.8

Rte 84: Black on Dumbarton Bridge from San Mateo/Alameda County line to Thornton Ave in Newark, PM 3.7



LEGEND (CLICK HERE FOR MORE DETAILED LEGEND)



National Network (STAA)



Terminal Access (STAA)



California Legal Network



Ca Legal Advisory Route

30



KPRA* Advisory



Route with Special Restrictions

Port



Port

Airport



Airport

*KPRA = kingpin-to-rear-axle distance

1.9 miles west of Winters (PM 5.9)

Near County Rd. 87 (PM 6.8)
Hastings Rd. 7 miles north of Jct Rte 12 (PM 7.0) to Dossier Railroad Crossing (PM 8.1)

RESTRICTIONS: For ferry limitations on Rte 84 and Rte 220, click on Special Truck Restrictions.

Jct Isleton Rd. at Sacramento River PM 5.9

Spruce St. at Second St. near Brentwood, PM 38.8

RESTRICTION: Rte 580 from Foothill Blvd. in San Leandro (PM 34.9) to Grand Ave. in Oakland (PM 43.6)

No trucks over 4.5 tons, except buses.
Vallecitos Nuclear Center, 2 miles north of Jct 680 (PM 19.9) to Vineyard Ave., 4.4 miles north of Jct 680 (PM 24.4)

RESTRICTION: Rte 84 Jct Rte 238 at Mission Blvd. (PM 10.8) to Jct Rte 680 (PM 18.0) No trucks transporting hazardous materials/waste due to adjacent drinking source. Otherwise, route is Advisory 32.

LOW CLEARANCE: SB Rte 238, Railroad Crossing 14'-0" (PM 2.2) between Rte 680 & 84

Alum Rock Ave. at Mt. Hamilton Rd., 2.3 miles north of Jct. 680, (PM 3.6)

Rte 82 is black thru San Jose from S. Market St. at E. San Carlos (PM 7.3) to E. Montgomery St. (PM 8.3)

RESTRICTION: Rte 85 Jct Rte 101 (PM 0.0) to Jct Rte 280 (PM 18.4) No trucks over 9,000 pounds gross vehicle weight. Road maintenance and emergency vehicles, buses, RVs allowed. Per CVC section 35722.

RESTRICTION: Rte 152 Carlton Rd. near Watsonville (PM SCR 3.7) to Watsonville Rd. near Gilroy (PM SCL 5.0). No trucks/combos over 45 feet.



California Department of Transportation
Truck Size Unit

TRUCK MAP LEGEND

TRUCK LENGTHS & ROUTES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION



Click here for the [Truck Network Map](#)

- STAA ROUTES In California, the STAA Network consists of the National Network (green) routes and Terminal Access (blue) routes.



STAA Truck Tractor - Semitrailer

Semitrailer length : 48 feet maximum
KPRA* : no limit
Overall length : no limit *(KPRA = kingpin-to-rear-axle)

Semitrailer length : over 48 feet up to 53 feet maximum
KPRA : 40 feet maximum for two or more axles,
38 feet maximum for single-axle trailers
Overall length : no limit

STAA Truck Tractor - Semitrailer - Trailer (Doubles)

Trailer length : 28 feet 6 inches maximum (each trailer)
Overall length : no limit



Terminal Access - STAA trucks may travel on State highways that exhibit this sign.



Service Access - STAA trucks may travel up to one road mile from the off ramp to obtain services (food, fuel, lodging, repairs), provided the route displays this sign.



CALIFORNIA LEGAL ROUTES California Legal trucks (black trucks) can travel on STAA routes (green and blue routes), CA Legal routes (black routes), and Advisory routes (yellow routes). CA Legal trucks have access to the entire State highway system except where prohibited (some red routes).



California Legal Truck Tractor - Semitrailer

Semitrailer length : no limit
KPRA : 40 feet maximum for two or more axles,
38 feet maximum for single-axle trailers
Overall length : 65 feet maximum

California Legal Truck Tractor - Semitrailer - Trailer (Doubles)

Option A

Trailer length : 28 feet 6 inches maximum (each trailer)
Overall length : 75 feet maximum

Option B

Trailer length : one trailer 28 feet 6 inches maximum
other trailer may be longer than 28 feet 6 inches
Overall length : 65 feet maximum



CA LEGAL ADVISORY ROUTES - CA Legal trucks only; however, **travel not advised** if KPRA length is over posted value. KPRA advisories range from 30 to 38 feet.



SPECIAL RESTRICTIONS - Route restricted for vehicle length or weight, cargo type, or number of axles.

AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #1 Mission Blvd/Niles Canyon Rd

 Cycle (sec): 115 Critical Vol./Cap.(X): 1.101
 Loss Time (sec): 16 Average Delay (sec/veh): 64.1
 Optimal Cycle: OPTIMIZED Level Of Service: E

Street Name: Mission Blvd Niles Canyon Rd				
Approach:	North Bound	South Bound	East Bound	
Movement:	L - T - R	L - T - R	L - T - R	
Control:	Protected	Protected	Split Phase	
Rights:	Include	Include	Include	
Min. Green:	0 0 0	0 0 0	0 0 0	
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	
Lanes:	1 0 2	0 1 3	0 1 2	
Volume Module: >> Count Date: 14 Feb 2007 <<				
Base Vol:	88 737 284	389 1643 19	13 137 225	449 82 554
Growth Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
Initial Bse:	88 737 284	389 1643 19	13 137 225	449 82 554
User Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
PHF Adj:	0.98 0.98	0.98 0.98	0.98 0.98	0.98 0.98
PHF Volume:	90 755 291	399 1683 19	13 140 231	460 84 568
Reduc Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Reduced Vol:	90 755 291	399 1683 19	13 140 231	460 84 568
PCE Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
MLF Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
FinalVolume:	90 755 291	399 1683 19	13 140 231	460 84 568
Saturation Flow Module:				
Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	0.95 0.95	0.85 0.92	0.95 0.85	0.91 0.91
Lanes:	1.00 2.00	1.00 3.00	2.00 0.05	0.52 1.43
Final Sat.:	1805 3610	1615 5253	3610 1615	85 901
Capacity Analysis Module:				
Vol/Sat:	0.05 0.21	0.18 0.08	0.47 0.01	0.16 0.16
Crit Moves:	****	***	***	***
Green/Cycle:	0.05 0.34	0.34 0.12	0.42 0.42	0.14 0.14
Volume/Cap:	1.10 0.61	0.52 0.61	1.10 1.10	0.03 1.10
Delay/Veh:	184.4 32.2	31.1 49.3	89.0 19.4	127.5 127
User DelAdj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
AdjDel/Veh:	184.4 32.2	31.1 49.3	89.0 19.4	127.5 127
LOS by Move:	F C	C D	D F	B F
HCM2k95thQ:	10 21	15 11	70 28	1 28

 Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #1 Mission Blvd/Niles Canyon Rd

 Cycle (sec): 115 Critical Vol./Cap.(X): 0.907
 Loss Time (sec): 16 Average Delay (sec/veh): 48.5
 Optimal Cycle: OPTIMIZED Level Of Service: D

Street Name: Mission Blvd Niles Canyon Rd				
Approach:	North Bound	South Bound	East Bound	
Movement:	L - T - R	L - T - R	L - T - R	
Control:	Protected	Protected	Split Phase	
Rights:	Include	Include	Include	
Min. Green:	0 0 0	0 0 0	0 0 0	
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	
Lanes:	1 0 2	0 1 3	0 2 0	
Volume Module: >> Count Date: 14 Feb 2007 <<				
Base Vol:	185 1133 450	756 995 13	6 213 164	390 113 417
Growth Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
Initial Bse:	185 1133 450	756 995 13	6 213 164	390 113 417
User Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
PHF Adj:	0.95 0.95	0.95 0.95	0.95 0.95	0.95 0.95
PHF Volume:	195 1193 474	796 1047 14	6 224 173	411 119 439
Reduc Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Reduced Vol:	195 1193 474	796 1047 14	6 224 173	411 119 439
PCE Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
MLF Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
FinalVolume:	195 1193 474	796 1047 14	6 224 173	411 119 439
Saturation Flow Module:				
Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	0.95 0.95	0.85 0.92	0.95 0.85	0.94 0.94
Lanes:	1.00 2.00	1.00 3.00	2.00 0.02	0.71 1.27
Final Sat.:	1805 3610	1615 5253	3610 1615	35 1257
Capacity Analysis Module:				
Vol/Sat:	0.11 0.33	0.29 0.15	0.29 0.15	0.01 0.18
Crit Moves:	****	***	***	***
Green/Cycle:	0.14 0.36	0.36 0.17	0.39 0.39	0.20 0.20
Volume/Cap:	0.75 0.91	0.80 0.91	0.75 0.91	0.02 0.91
Delay/Veh:	58.6 44.0	40.8 60.0	32.7 21.8	67.1 67.1
User DelAdj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
AdjDel/Veh:	58.6 44.0	40.8 60.0	32.7 21.8	67.1 67.1
LOS by Move:	E D	D E	C C	B E
HCM2k95thQ:	13 38	27 23	31 1	26 26

 Note: Queue reported is the number of cars per lane.

AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #2 Mission Blvd/Mowry Ave

Cycle (sec): 90 Critical Vol./Cap.(X): 0.982
 Loss Time (sec): 12 Average Delay (sec/veh): 26.6
 Optimal Cycle: OPTIMIZED Level Of Service: C

Street Name: Mission Blvd Mowry Ave				
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ovl	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 2 1 0	1 0 3 0 1	1 1 0 0 1	0 0 1! 0 0

Volume Module: >> Count Date: 13 Feb 2008 <<

Base Vol:	287	622	3	2	1415	1037	455	2	287	6	5	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	287	622	3	2	1415	1037	455	2	287	6	5	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	301	653	3	2	1486	1089	478	2	301	6	5	5
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	301	653	3	2	1486	1089	478	2	301	6	5	5
PCB Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	301	653	3	2	1486	1089	478	2	301	6	5	5

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.95	0.95	0.85	0.94	0.94	0.94
Lanes:	1.00	2.99	0.01	1.00	3.00	1.00	1.99	0.01	1.00	0.38	0.31	0.31
Final Sat.:	1805	5157	25	1805	5187	1615	3606	16	1615	670	559	559

Capacity Analysis Module:

Vol/Sat:	0.17	0.13	0.13	0.00	0.29	0.67	0.13	0.13	0.19	0.01	0.01	0.01
Crit Moves:	****			****		****	****		****			
Green/Cycle:	0.17	0.72	0.72	0.01	0.55	0.74	0.19	0.19	0.19	0.01	0.01	0.01
Volume/Cap:	0.98	0.18	0.18	0.18	0.52	0.91	0.70	0.70	0.98	0.98	0.98	0.98
Delay/Veh:	83.4	4.2	4.2	51.5	12.8	19.4	37.2	37.2	82.5	252.9	253	252.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	83.4	4.2	4.2	51.5	12.8	19.4	37.2	37.2	82.5	252.9	253	252.9
LOS by Move:	F	A	A	D	B	B	D	D	F	F	F	F
HCM2k95thQ:	20	4	4	0	16	37	14	14	24	4	4	4

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
 2000 HCM Operations Method (Base Volume Alternative)

Intersection #2 Mission Blvd/Mowry Ave

Cycle (sec): 90 Critical Vol./Cap.(X): 0.752
 Loss Time (sec): 12 Average Delay (sec/veh): 25.2
 Optimal Cycle: OPTIMIZED Level Of Service: C

Street Name: Mission Blvd Mowry Ave				
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ovl	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 2 1 0	1 0 3 0 1	1 1 0 0 1	0 0 1! 0 0

Volume Module: >> Count Date: 13 Feb 2008 <<

Base Vol:	301	959	6	11	727	674	1020	3	209	5	8	4
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	301	959	6	11	727	674	1020	3	209	5	8	4
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	328	1044	7	12	791	733	1110	3	227	5	9	4
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	328	1044	7	12	791	733	1110	3	227	5	9	4
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	328	1044	7	12	791	733	1110	3	227	5	9	4

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.95	0.95	0.85	0.95	0.95	0.95
Lanes:	1.00	2.98	0.02	1.00	3.00	1.00	1.99	0.01	1.00	0.29	0.47	0.24
Final Sat.:	1805	5150	32	1805	5187	1615	3611	11	1615	533	853	427

Capacity Analysis Module:

Vol/Sat:	0.18	0.20	0.20	0.01	0.15	0.45	0.31	0.31	0.14	0.01	0.01	0.01
Crit Moves:	****			****		****	****		****			
Green/Cycle:	0.24	0.43	0.43	0.01	0.20	0.61	0.41	0.41	0.41	0.01	0.01	0.01
Volume/Cap:	0.75	0.47	0.47	0.47	0.75	0.74	0.75	0.75	0.34	0.75	0.75	0.75
Delay/Veh:	38.8	18.5	18.5	57.2	36.8	15.5	24.9	24.9	18.6	123.6	124	123.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	38.8	18.5	18.5	57.2	36.8	15.5	24.9	24.9	18.6	123.6	124	123.6
LOS by Move:	D	B	B	E	D	B	C	C	B	F	F	F
HCM2k95thQ:	16	14	14	1	14	25	26	26	9	3	3	3

Note: Queue reported is the number of cars per lane.

AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
 2000 HCM Operations Method (Base Volume Alternative)

Intersection #3 Mission Blvd/Walnut Ave

Cycle (sec): 120 Critical Vol./Cap.(X): 0.960
 Loss Time (sec): 16 Average Delay (sec/veh): 45.5
 Optimal Cycle: 169 Level Of Service: D

Street Name:	Mission Blvd	Walnut Ave		
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 1	1 0 2	0 1 1	1 0 0 1

Volume Module: >> Count Date: 13 Feb 2008 <<
Base Vol: 307 729 24 8 1449 338 158 26 278 66 51 8
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 307 729 24 8 1449 338 158 26 278 66 51 8
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume: 327 777 26 9 1545 360 168 28 296 70 54 9
Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 327 777 26 9 1545 360 168 28 296 70 54 9
PCB Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 327 777 26 9 1545 360 168 28 296 70 54 9

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.95 0.95 0.95 0.85 0.92 1.00 0.85 0.95 0.98 0.98
Lanes: 1.00 1.94 0.06 1.00 2.00 1.00 2.00 1.00 1.00 0.86 0.14
Final Sat.: 1805 3477 114 1805 3610 1615 3502 1900 1615 1805 1610 252

Capacity Analysis Module:
Vol/Sat: 0.18 0.22 0.22 0.00 0.43 0.22 0.05 0.01 0.18 0.04 0.03 0.03
Crit Moves: **** **** * **** *
Green/Cycle: 0.19 0.62 0.62 0.01 0.45 0.45 0.14 0.19 0.19 0.04 0.10 0.10
Volume/Cap: 0.96 0.36 0.36 0.36 0.96 0.50 0.35 0.08 0.96 0.96 0.35 0.35
Delay/Veh: 86.2 11.2 11.2 67.8 46.2 24.3 47.5 39.9 88.4 148.4 52.0 52.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 86.2 11.2 11.2 67.8 46.2 24.3 47.5 39.9 88.4 148.4 52.0 52.0
LOS by Move: F B B E D C D D F F D D
HCM2k95thQ: 25 14 14 1 52 17 6 2 27 10 5 5

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
 2000 HCM Operations Method (Base Volume Alternative)

Intersection #3 Mission Blvd/Walnut Ave

Cycle (sec): 120 Critical Vol./Cap.(X): 0.750
 Loss Time (sec): 16 Average Delay (sec/veh): 33.7
 Optimal Cycle: 81 Level Of Service: C

Street Name:	Mission Blvd	Walnut Ave		
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 1	1 0 2	0 1 1	1 0 0 1

Volume Module: >> Count Date: 13 Feb 2008 <<
Base Vol: 310 1130 60 11 818 161 295 54 311 24 36 5
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 310 1130 60 11 818 161 295 54 311 24 36 5
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 333 1215 65 12 880 173 317 58 334 26 39 5
Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 333 1215 65 12 880 173 317 58 334 26 39 5
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 333 1215 65 12 880 173 317 58 334 26 39 5

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.94 0.94 0.95 0.95 0.85 0.92 1.00 0.85 0.95 0.98 0.98
Lanes: 1.00 1.90 0.10 1.00 2.00 1.00 2.00 1.00 1.00 0.88 0.12
Final Sat.: 1805 3404 181 1805 3610 1615 3502 1900 1615 1805 1638 228

Capacity Analysis Module:
Vol/Sat: 0.18 0.36 0.36 0.01 0.24 0.11 0.09 0.03 0.21 0.01 0.02 0.02
Crit Moves: **** **** * **** *
Green/Cycle: 0.25 0.56 0.56 0.01 0.33 0.33 0.23 0.28 0.28 0.02 0.06 0.06
Volume/Cap: 0.75 0.64 0.64 0.64 0.75 0.33 0.39 0.11 0.75 0.75 0.39 0.39
Delay/Veh: 48.8 18.7 18.7 114.6 38.9 31.0 39.0 32.5 46.6 120.2 56.3 56.3
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 48.8 18.7 18.7 114.6 38.9 31.0 39.0 32.5 46.6 120.2 56.3 56.3
LOS by Move: D B B F D C D C D F E E
HCM2k95thQ: 21 29 29 1 26 9 10 3 23 4 4 4

Note: Queue reported is the number of cars per lane.

AM Existing

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AM Peak Hour - Existing Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

City of Fremont

```
*****
Cycle (sec): 70 Critical Vol./Cap.(X): 0.820
Loss Time (sec): 16 Average Delay (sec/veh): 20.2
Optimal Cycle: OPTIMIZED Level Of Service: C
*****
Street Name: Mission Blvd Stevenson Blvd
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Protected Protected Split Phase Split Phase
Rights: Include Include Ovl Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 1 1 0 1 0 2 0 1 1 1 0 0 2 1 0 0 1 0 0 1 0
-----
Volume Module: >> Count Date: 5 Feb 2008 <<
Base Vol: 461 961 27 27 1424 306 122 16 512 29 14 8
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 461 961 27 27 1424 306 122 16 512 29 14 8
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 494 1029 29 29 1525 328 131 17 548 31 15 9
Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 494 1029 29 29 1525 328 131 17 548 31 15 9
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 494 1029 29 29 1525 328 131 17 548 31 15 9
-----
Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.95 0.95 0.95 0.95 0.85 0.96 0.96 0.75 0.95 0.95 0.95
Lanes: 2.00 1.95 0.05 1.00 2.00 1.00 1.77 0.23 2.00 1.00 0.64 0.36
Final Sat.: 3502 3497 98 1805 3610 1615 3218 422 2842 1805 1143 653
-----
Capacity Analysis Module:
Vol/Sat: 0.14 0.29 0.29 0.02 0.42 0.20 0.04 0.04 0.19 0.02 0.01 0.01
Crit Moves: **** **** **** ****
Green/Cycle: 0.17 0.65 0.65 0.04 0.52 0.52 0.06 0.06 0.24 0.02 0.02 0.02
Volume/Cap: 0.82 0.45 0.45 0.45 0.82 0.39 0.64 0.64 0.82 0.82 0.63 0.63
Delay/Veh: 36.7 6.2 6.2 38.1 17.3 10.6 38.0 38.0 33.3 112.4 62.6 62.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 36.7 6.2 6.2 38.1 17.3 10.6 38.0 38.0 33.3 112.4 62.6 62.6
LOS by Move: D A A D B B D D C F E E
HCM2k95thQ: 11 11 11 1 24 8 6 6 17 4 3 3
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Note: Queue reported is the number of cars per lane

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PM Peak Hour - Existing Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

City of Fremont

Level Of Service Computation Report

City of Fremont

Level of Service Compensation Rule Operations Method (Base Volume)

City of Fremont

Level of Service Compensation Rule Operations Method (Base Volume)

City of Fremont

```
*****
Cycle (sec): 70 Critical Vol./Cap.(X): 0.820
Loss Time (sec): 16 Average Delay (sec/veh): 20.2
Optimal Cycle: OPTIMIZED Level Of Service: C
*****
Street Name: Mission Blvd Stevenson Blvd
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Protected Protected Split Phase Split Phase
Rights: Include Include Ovl Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 1 1 0 1 0 2 0 1 1 1 0 0 2 1 0 0 1 0 0 1 0
-----
Volume Module: >> Count Date: 5 Feb 2008 <<
Base Vol: 461 961 27 27 1424 306 122 16 512 29 14 8
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 461 961 27 27 1424 306 122 16 512 29 14 8
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 494 1029 29 29 1525 328 131 17 548 31 15 9
Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 494 1029 29 29 1525 328 131 17 548 31 15 9
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 494 1029 29 29 1525 328 131 17 548 31 15 9
-----
Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.95 0.95 0.95 0.95 0.85 0.96 0.96 0.75 0.95 0.95 0.95
Lanes: 2.00 1.95 0.05 1.00 2.00 1.00 1.77 0.23 2.00 1.00 0.64 0.36
Final Sat.: 3502 3497 98 1805 3610 1615 3218 422 2842 1805 1143 653
-----
Capacity Analysis Module:
Vol/Sat: 0.14 0.29 0.29 0.02 0.42 0.20 0.04 0.04 0.19 0.02 0.01 0.01
Crit Moves: **** **** **** ****
Green/Cycle: 0.17 0.65 0.65 0.04 0.52 0.52 0.06 0.06 0.24 0.02 0.02 0.02
Volume/Cap: 0.82 0.45 0.45 0.45 0.82 0.39 0.64 0.64 0.82 0.82 0.63 0.63
Delay/Veh: 36.7 6.2 6.2 38.1 17.3 10.6 38.0 38.0 33.3 112.4 62.6 62.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 36.7 6.2 6.2 38.1 17.3 10.6 38.0 38.0 33.3 112.4 62.6 62.6
LOS by Move: D A A D B B D D C F E E
HCM2k95thQ: 11 11 11 1 24 8 6 6 17 4 3 3
*****
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Note: Queue reported is the number of cars per lane.

AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #5 Mission Blvd/Driscoll Rd

Cycle (sec):	Critical Vol./Cap.(X):				
	65	0.775			
Loss Time (sec):	16	Average Delay (sec/veh):	18.5		
Optimal Cycle:	68	Level Of Service:	B		
Street Name:	Mission Blvd	Driscoll Rd			
Approach:	North Bound	South Bound	East Bound	West Bound	
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	
Control:	Protected	Protected	Split Phase	Split Phase	
Rights:	Include	Include	Include	Include	
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0	
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	
Lanes:	2 0 1 1 0	1 0 1 1 0	1 1 0 0 1	1 0 1 0 1	
Volume Module:					
Base Vol:	134 1060	33 23	1205 167	276 31	197 32
Growth Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
Initial Bse:	134 1060	33 23	1205 167	276 31	197 32
User Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
PHF Adj:	0.97 0.97	0.97 0.97	0.97 0.97	0.97 0.97	0.97 0.97
PHF Volume:	139 1096	34 24	1246 173	285 32	204 33
Reduc Vol:	0 0	0 0	0 0	0 0	0 0
Reduced Vol:	139 1096	34 24	1246 173	285 32	204 33
PCB Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
MLF Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
FinalVolume:	139 1096	34 24	1246 173	285 32	204 33
Saturation Flow Module:					
Sat/Lane:	1900 1900	1900 1900	1900 1900	1900 1900	1900 1900
Adjustment:	0.92 0.95	0.95 0.93	0.93 0.96	0.96 0.98	0.85 0.85
Lanes:	2.00 1.94	0.06 1.00	1.76 0.24	1.80 0.20	1.00 1.00
Final Sat.:	3502 3487	109 1805	3114 432	3269 367	1615 1805
Capacity Analysis Module:					
Vol/Sat:	0.04 0.31	0.31 0.01	0.40 0.40	0.09 0.09	0.13 0.13
Crit Moves:	****	****	****	****	****
Green/Cycle:	0.05 0.54	0.54 0.02	0.52 0.52	0.16 0.16	0.16 0.02
Volume/Cap:	0.78 0.58	0.58 0.58	0.78 0.78	0.54 0.54	0.78 0.78
Delay/Veh:	49.3 10.3	10.3 50.1	14.8 14.8	25.9 25.9	39.5 39.7
User DelAdj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
AdjDel/Veh:	49.3 10.3	10.3 50.1	14.8 14.8	25.9 25.9	39.5 39.7
LOS by Move:	D B	B B	B C	C D	F F
HCM2k95thQ:	3 15	15 1	21 21	7 7	12 4

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #5 Mission Blvd/Driscoll Rd

Cycle (sec):	Critical Vol./Cap.(X):				
	65	1.045			
Loss Time (sec):	16	Average Delay (sec/veh):	47.9		
Optimal Cycle:	134	Level Of Service:	D		
Street Name:	Mission Blvd	Driscoll Rd			
Approach:	North Bound	South Bound	East Bound	West Bound	
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	
Control:	Protected	Protected	Split Phase	Split Phase	
Rights:	Include	Include	Include	Include	
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0	
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	
Lanes:	2 0 1 1 0	1 0 1 1 0	1 1 0 0 1	1 0 1 0 1	
Volume Module: >> Count Date: 18 Nov 2009 <<					
Base Vol:	277 1021	34 2	1285 230	169 26	286 61
Growth Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
Initial Bse:	277 1021	34 2	1285 230	169 26	286 61
User Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
PHF Adj:	0.93 0.93	0.93 0.93	0.93 0.93	0.93 0.93	0.93 0.93
PHF Volume:	299 1104	37 2	1389 249	183 28	309 66
Reduc Vol:	0 0	0 0	0 0	0 0	0 0
Reduced Vol:	299 1104	37 2	1389 249	183 28	309 66
PCE Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
MLF Adj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
FinalVolume:	299 1104	37 2	1389 249	183 28	309 66
Saturation Flow Module:					
Sat/Lane:	1900 1900	1900 1900	1900 1900	1900 1900	1900 1900
Adjustment:	0.92 0.95	0.95 0.93	0.93 0.96	0.96 0.98	0.85 0.85
Lanes:	2.00 1.94	0.06 1.00	1.70 0.30	1.73 0.27	1.00 1.00
Final Sat.:	3502 3476	116 1805	2992 535	3155 485	1615 1805
Capacity Analysis Module:					
Vol/Sat:	0.09 0.32	0.32 0.00	0.46 0.46	0.06 0.06	0.19 0.19
Crit Moves:	****	****	****	****	****
Green/Cycle:	0.08 0.52	0.52 0.00	0.44 0.44	0.18 0.18	0.18 0.18
Volume/Cap:	1.04 0.61	0.61 0.61	1.04 1.04	0.32 0.32	1.04 1.04
Delay/Veh:	95.1 11.3	11.3 191.1	53.4 53.4	23.3 23.3	91.0 79.3
User DelAdj:	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00	1.00 1.00
AdjDel/Veh:	95.1 11.3	11.3 191.1	53.4 53.4	23.3 23.3	91.0 79.3
LOS by Move:	F B	B B	F D	D C	C F
HCM2k95thQ:	10 16	16 0	40 40	4 4	23 23

Note: Queue reported is the number of cars per lane.

AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #6 Mission Blvd/Palm Ave

Cycle (sec): 155 Critical Vol./Cap.(X): 1.068
 Loss Time (sec): 16 Average Delay (sec/veh): 65.3
 Optimal Cycle: OPTIMIZED Level Of Service: E

Street Name: Mission Blvd Palm Ave				
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Permitted	Permitted
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 1	1 0 1	1 0 0	0 0 1!

Volume Module:

Base Vol:	135	981	66	55	1395	270	107	1	173	76	8	39
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	135	981	66	55	1395	270	107	1	173	76	8	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
PHF Volume:	173	1258	85	71	1788	346	137	1	222	97	10	50
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	173	1258	85	71	1788	346	137	1	222	97	10	50
PCB Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	173	1258	85	71	1788	346	137	1	222	97	10	50

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.93	0.93	0.74	0.74	0.74	0.52	0.52	0.52
Lanes:	1.00	1.87	0.13	1.00	1.68	0.32	0.38	0.01	0.61	0.62	0.06	0.32
Final Sat.:	1805	3352	226	1805	2952	571	535	5	866	606	64	311

Capacity Analysis Module:

Vol/Sat:	0.10	0.38	0.38	0.04	0.61	0.61	0.26	0.26	0.26	0.16	0.16	0.16
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green/Cycle:	0.09	0.59	0.59	0.06	0.57	0.57	0.24	0.24	0.24	0.24	0.24	0.24
Volume/Cap:	1.07	0.63	0.63	0.63	1.07	1.07	1.07	1.07	1.07	0.67	0.67	0.67
Delay/Veh:	160.6	21.0	21.0	82.0	74.8	74.8	127.2	127	127.2	60.7	60.7	60.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	160.6	21.0	21.0	82.0	74.8	74.8	127.2	127	127.2	60.7	60.7	60.7
LOS by Move:	F	C	C	F	E	E	F	F	F	E	E	E
HCM2k95thQ:	20	36	36	6	95	95	40	40	40	15	15	15

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
 2000 HCM Operations Method (Base Volume Alternative)

Intersection #6 Mission Blvd/Palm Ave

Cycle (sec): 155 Critical Vol./Cap.(X): 0.709
 Loss Time (sec): 16 Average Delay (sec/veh): 22.6
 Optimal Cycle: OPTIMIZED Level Of Service: C

Street Name: Mission Blvd Palm Ave				
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Permitted	Permitted
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 1	1 0 1	1 0 0	0 0 1!

Volume Module:

Base Vol:	71	1133	6	21	1236	180	113	11	59	4	3	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	71	1133	6	21	1236	180	113	11	59	4	3	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	80	1273	7	24	1389	202	127	12	66	4	3	9
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	1273	7	24	1389	202	127	12	66	4	3	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	80	1273	7	24	1389	202	127	12	66	4	3	9

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.93	0.93	0.76	0.76	0.76	0.87	0.87	0.87
Lanes:	1.00	1.99	0.01	1.00	1.75	0.25	0.62	0.06	0.32	0.27	0.20	0.53
Final Sat.:	1805	3587	19	1805	3091	450	889	87	464	440	330	880

Capacity Analysis Module:

Vol/Sat:	0.04	0.35	0.35	0.01	0.45	0.45	0.14	0.14	0.14	0.01	0.01	0.01
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green/Cycle:	0.06	0.67	0.67	0.02	0.63	0.63	0.20	0.20	0.20	0.20	0.20	0.20
Volume/Cap:	0.71	0.53	0.53	0.53	0.71	0.71	0.71	0.71	0.71	0.05	0.05	0.05
Delay/Veh:	90.2	13.2	13.2	86.1	20.0	20.0	65.6	65.6	65.6	50.0	50.0	50.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	90.2	13.2	13.2	86.1	20.0	20.0	65.6	65.6	65.6	50.0	50.0	50.0
LOS by Move:	F	B	B	F	C	C	E	E	E	D	D	D
HCM2k95thQ:	8	28	28	2	40	40	19	19	19	1	1	1

Note: Queue reported is the number of cars per lane.

AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #7 Mission Boulevard/I-680 SB Ramps

Cycle (sec): 55 Critical Vol./Cap.(X): 0.779
 Loss Time (sec): 12 Average Delay (sec/veh): 12.4
 Optimal Cycle: OPTIMIZED Level Of Service: B

Street Name: Mission Boulevard I-680 SB Ramps			
Approach:	North Bound	South Bound	East Bound
Movement:	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected
Rights:	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 2	0 0 1	1 1 0

Volume Module: >> Count Date: 18 May 2011 <<									
Base Vol:	67	923	0	0	1255	747	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	67	923	0	0	1255	747	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	73	1003	0	0	1364	812	0	0	0
Reduc Vol:	0	0	0	0	0	0	0	0	0
Reduced Vol:	73	1003	0	0	1364	812	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	73	1003	0	0	1364	812	0	0	0

Saturation Flow Module:									
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.90	0.90	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.88	1.12	0.00	0.00	0.99
Final Sat.:	1805	3610	0	0	3204	1907	0	0	1609

Capacity Analysis Module:									
Vol/Sat:	0.04	0.28	0.00	0.00	0.43	0.43	0.00	0.00	0.14
Crit Moves:	****	****	****	****	****	****	****	****	****
Green/Cycle:	0.05	0.60	0.00	0.00	0.55	0.55	0.00	0.00	0.18
Volume/Cap:	0.78	0.46	0.00	0.00	0.78	0.78	0.00	0.00	0.78
Delay/Veh:	58.9	6.3	0.0	0.0	11.3	11.3	0.0	0.0	33.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.9	6.3	0.0	0.0	11.3	11.3	0.0	0.0	33.8
LOS by Move:	E	A	A	A	B	B	A	A	C
HCM2k95thQ:	3	10	0	0	17	17	0	0	12

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #7 Mission Boulevard/I-680 SB Ramps

Cycle (sec): 55 Critical Vol./Cap.(X): 0.530
 Loss Time (sec): 12 Average Delay (sec/veh): 9.7
 Optimal Cycle: OPTIMIZED Level Of Service: A

Street Name: Mission Boulevard I-680 SB Ramps			
Approach:	North Bound	South Bound	East Bound
Movement:	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected
Rights:	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 2	0 0 1	1 1 0

Volume Module:									
Base Vol:	58	938	0	0	850	450	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	58	938	0	0	850	450	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	62	998	0	0	904	479	0	0	0
Reduc Vol:	0	0	0	0	0	0	0	0	0
Reduced Vol:	62	998	0	0	904	479	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	62	998	0	0	904	479	0	0	0

Saturation Flow Module:									
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.90	0.90	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.96	1.04	0.00	0.00	0.95
Final Sat.:	1805	3610	0	0	3356	1777	0	0	1551

Capacity Analysis Module:									
Vol/Sat:	0.03	0.28	0.00	0.00	0.27	0.27	0.00	0.00	0.11
Crit Moves:	****	****	****	****	****	****	****	****	****
Green/Cycle:	0.06	0.57	0.00	0.00	0.51	0.51	0.00	0.00	0.21
Volume/Cap:	0.53	0.48	0.00	0.00	0.53	0.53	0.00	0.00	0.53
Delay/Veh:	29.5	7.1	0.0	0.0	9.3	9.3	0.0	0.0	20.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.5	7.1	0.0	0.0	9.3	9.3	0.0	0.0	20.9
LOS by Move:	C	A	A	A	A	A	A	A	C
HCM2k95thQ:	2	10	0	0	10	10	0	0	7

Note: Queue reported is the number of cars per lane.

</

AM Existing

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AM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 Mission Blvd/I-680 NB Ramps

Street Name:	Mission Blvd I-680 NB Ramps			
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ignore	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 1	1 0 2	0 1	0 0 1

Volume Module:												
Base Vol:	99	650	17	107	1002	438	370	45	19	24	45	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	99	650	17	107	1002	438	370	45	19	24	45	29
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	106	699	18	115	1077	0	398	48	20	26	48	31
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	106	699	18	115	1077	0	398	48	20	26	48	31
PCB Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	106	699	18	115	1077	0	398	48	20	26	48	31

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.98	0.98	0.85
Lanes:	1.00	1.95	0.05	1.00	2.00	1.00	1.74	0.18	0.08	0.35	0.65	1.00
Final Sat.:	1805	3504	92	1805	3610	1900	3154	327	138	650	1218	1615

Capacity Analysis Module:												
Vol/Sat:	0.06	0.20	0.20	0.06	0.30	0.00	0.13	0.15	0.15	0.04	0.04	0.02
Crit Moves:	****			****		****		****		****		****
Green/Cycle:	0.08	0.35	0.35	0.11	0.39	0.00	0.19	0.19	0.19	0.05	0.05	0.05
Volume/Cap:	0.77	0.57	0.57	0.57	0.77	0.00	0.66	0.77	0.77	0.77	0.77	0.37
Delay/Veh:	47.5	15.0	15.0	26.8	17.3	0.0	22.7	27.0	27.0	56.3	56.3	28.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.5	15.0	15.0	26.8	17.3	0.0	22.7	27.0	27.0	56.3	56.3	28.0
LOS by Move:	D	B	B	C	B	A	C	C	C	E	E	C
HCM2k95thQ:	7	11	11	4	16	0	10	12	12	6	6	2

Note: Queue reported is the number of cars per lane.

PM Existing

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PM Peak Hour - Existing Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 Mission Blvd/I-680 NB Ramps

Street Name:	Mission Blvd I-680 NB Ramps			
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ignore	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Y+R:	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0
Lanes:	1 0 1	1 0 2	0 1	0 0 1

Volume Module:												
Base Vol:	499	697	17	64	463	426	235	39	23	34	52	24
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	499	697	17	64	463	426	235	39	23	34	52	24
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.00	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	531	741	18	68	493	0	250	41	24	36	55	26
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	531	741	18	68	493	0	250	41	24	36	55	26
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	531	741	18	68	493	0	250	41	24	36	55	26

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.98	0.98
Lanes:	1.00	1.95	0.05	1.00	2.00	1.00	1.65	0.22	0.13	0.40	0.60	1.00
Final Sat.:	1805	3510	86	1805	3610	1900	2988	392	231	737	1127	1615

Capacity Analysis Module:												
Vol/Sat:	0.29	0.21	0.21	0.04	0.14	0.00	0.08	0.11	0.11	0.05	0.05	0.02
Crit Moves:	****			****		****		****		****		****
Green/Cycle:	0.36	0.44	0.44	0.08	0.17	0.00	0.13	0.13	0.13	0.06	0.06	0.06
Volume/Cap:	0.83	0.48	0.48	0.48	0.83	0.00	0.65	0.83	0.83	0.83	0.83	0.27
Delay/Veh:	24.7	11.1	11.1	26.7	31.4	0.0	26.0	37.0	37.0	63.1	63.1	26.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.7	11.1	11.1	26.7	31.4	0.0	26.0	37.0	37.0	63.1	63.1	26.2
LOS by Move:	C	B	B	C	C	A	C	D	D	E	E	C
HCM2k95thQ:	20	10	10	2	9	0	8	11	11	7	7	1

Note: Queue reported is the number of cars per lane.

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AM Peak Hour - Existing with Restriction Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
 2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Mission Blvd/Niles Canyon Rd

Cycle (sec): 115 Critical Vol./Cap.(X): 1.118
 Loss Time (sec): 16 Average Delay (sec/veh): 67.3
 Optimal Cycle: 180 Level Of Service: E

Street Name:	Mission Blvd				Niles Canyon Rd											
Approach:	North Bound		South Bound		East Bound		West Bound									
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	
Control:	Protected				Protected				Split Phase				Split Phase			
Rights:	Include				Include				Include				Ovl			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	1	0	2	0	1	3	0	2	0	1	0	0	1!	0	1	

Volume Module: >> Count Date: 14 Feb 2007 <<																
Base Vol:	88	737	284	389	1643	19	13	137	225	449	82	554				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	88	737	284	389	1643	19	13	137	225	449	82	554				
Added Vol:	0	48	0	0	94	0	0	0	0	0	0	0				
Redirected:	0	0	0	-94	0	0	0	0	0	0	0	-48				
Initial Fut:	88	785	284	295	1737	19	13	137	225	449	82	506				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98				
PHF Volume:	90	804	291	302	1780	19	13	140	231	460	84	518				
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	90	804	291	302	1780	19	13	140	231	460	84	518				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	90	804	291	302	1780	19	13	140	231	460	84	518				

Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Adjustment:	0.95	0.95	0.85	0.92	0.95	0.85	0.91	0.91	0.91	0.92	1.00	0.85				
Lanes:	1.00	2.00	1.00	3.00	2.00	1.00	0.05	0.52	1.43	2.00	1.00	1.00				
Final Sat.:	1805	3610	1615	5253	3610	1615	85	901	2465	3502	1900	1615				

Capacity Analysis Module:																
Vol/Sat:	0.05	0.22	0.18	0.06	0.49	0.01	0.16	0.16	0.09	0.13	0.04	0.32				
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****				
Green/Cycle:	0.04	0.39	0.39	0.10	0.44	0.44	0.14	0.14	0.14	0.24	0.24	0.34				
Volume/Cap:	1.12	0.58	0.47	0.58	1.12	0.03	1.12	1.12	0.67	0.56	0.19	0.96				
Delay/Veh:	190.7	28.5	27.0	51.0	94.3	18.2	133.8	134	50.1	39.5	35.3	65.5				
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
AdjDel/Veh:	190.7	28.5	27.0	51.0	94.3	18.2	133.8	134	50.1	39.5	35.3	65.5				
LOS by Move:	F	C	C	D	F	B	F	F	D	D	D	E				
HCM2k95thQ:	10	21	14	9	75	1	29	29	13	15	5	38				

PM Peak Hour - Existing with Restriction Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report
 2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Mission Blvd/Niles Canyon Rd

Cycle (sec): 115 Critical Vol./Cap.(X): 0.936
 Loss Time (sec): 16 Average Delay (sec/veh): 48.6
 Optimal Cycle: 146 Level Of Service: D

Street Name:	Mission Blvd				Niles Canyon Rd											
Approach:	North Bound		South Bound		East Bound		West Bound									
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	
Control:	Protected				Protected				Split Phase				Split Phase			
Rights:	Include				Include				Include				Ovl			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	1	0	2	0	1	3	0	2	0	1	0	0	1!	0	1	

Volume Module: >> Count Date: 14 Feb 2007 <<																
Base Vol:	185	1133	450	756	995	13	6	213	164	390	113	417				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	185	1133	450	756	995	13	6	213	164	390	113	417				
Added Vol:	0	124	0	0	38	0	0	0	0	0	0	0				
Redirected:	0	0	0	-38	0	0	0	0	0	0	0	0				-124
Initial Fut:	185	1257	450	718	1033	13	6	213	164	390	113	293				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95				
PHF Volume:	195	1323	474	756	1087	14	6	224	173	411	119	308				
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	195	1323	474	756	1087	14	6	224	173	411	119	308				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	195	1323	474	756	1087	14	6	224	173	411	119	308				

Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Adjustment:	0.95	0.95	0.85	0.92	0.95	0.85	0.94	0.94	0.94	0.94	0.94	0.85				
Lanes:	1.00	2.00	1.00	3.00	2.00	1.00	0.02	0.71	1.27	2.00	1.00	1.00				
Final Sat.:	1805	3610	1615	5253	3610	1615	35	1257	2261	3502	1900	1615				

Capacity Analysis Module:																
Vol/Sat:	0.11	0.37	0.29	0.14	0.30	0.01	0.18	0.18	0.08	0.12	0.06	0.19				
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****				
Green/Cycle:	0.14	0.39	0.39	0.15	0.40	0.40	0.19	0.19	0.19	0.13	0.13	0.28				
Volume/Cap:	0.75	0.94	0.75	0.94	0.75	0.02	0.94	0.94	0.40	0.94	0.50	0.68				
Delay/Veh:	58.8	45.5	35.1	66.2	31.7	20.8	73.8	73.8	41.1	77.4	48.6	41.3				
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
AdjDel/Veh:	58.8	45.5	35.1	66.2	31.7	20.8	73.8	73.8	41.1	77.4	48.6	41.3				
LOS by Move:	E	D	D	E	C	C	E	E	D	E	D	D				
HCM2k95thQ:	13	43	26	23	32	1	27	27	9	20	9	20				

AM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #2 Mission Blvd/Mowry Ave

Cycle (sec):	90	Critical Vol./Cap.(X):	0.982
Loss Time (sec):	12	Average Delay (sec/veh):	26.2
Optimal Cycle:	153	Level Of Service:	C

Street Name:	Mission Blvd				Mowry Ave															
Approach:	North Bound		South Bound		East Bound		West Bound													
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Split Phase				Split Phase							
Rights:	Include				Ovl				Include				Include							
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0					
Lanes:	1	0	2	1	0	1	0	3	0	1	1	1	0	0	1	0	0	1	0	

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Volume Module: >> Count Date: 13 Feb 2008 <<
Base Vol:    287 622   3     2 1415 1037   455   2   287   6   5   5
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 287 622   3     2 1415 1037   455   2   287   6   5   5
Added Vol:   0     48    0     0 94    0     0     0     0     0     0     0
PasserByVol: 0     0     0     0 0     0     0     0     0     0     0     0
Initial Fut: 287 670   3     2 1509 1037   455   2   287   6   5   5
User Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:   0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 301 704   3     2 1585 1089   478   2   301   6   5   5
Reducut Vol: 0     0     0     0 0     0     0     0     0     0     0     0
Reduced Vol: 301 704   3     2 1585 1089   478   2   301   6   5   5
PCE Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 301 704   3     2 1585 1089   478   2   301   6   5   5
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
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PM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative

Intersection #2 Mission Blvd/Mowry Ave

Cycle (sec): 90 Critical Vol./Cap.(X): 0.761
 Loss Time (sec): 12 Average Delay (sec/veh): 25.3
 Optimal Cycle: 67 Level Of Service: C

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Saturation Flow Module:
Sat/Lane:   1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.91 0.91 0.95 0.91 0.85 0.95 0.95 0.85 0.95 0.95 0.95 0.95 0.95 0.95
Lanes:      1.00 2.98 0.02 1.00 3.00 1.00 1.99 0.01 1.00 0.29 0.47 0.24
Final Sat.: 1805 5153 29 1805 5187 1615 3611 11 1615 533 853 427

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Capacity Analysis Module:												
Vol/Sat:	0.18	0.23	0.23	0.01	0.16	0.45	0.31	0.31	0.14	0.01	0.01	0.01
Crit Moves:	****			*****		*****				****		
Green/Cycle:	0.24	0.44	0.44	0.01	0.21	0.61	0.40	0.40	0.40	0.01	0.01	0.01
Volume/Cap:	0.76	0.52	0.52	0.52	0.76	0.74	0.76	0.76	0.35	0.76	0.76	0.76
Delay/Veh:	39.7	18.7	18.7	64.6	36.6	15.2	25.5	25.5	18.9	127.4	127	127.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.7	18.7	18.7	64.6	36.6	15.2	25.5	25.5	18.9	127.4	127	127.4
LOS by Move:	D	B	B	E	D	B	C	C	B	F	F	F
HCM2k95thQ:	16	16	16	1	15	25	26	26	9	3	3	3

AM Peak Hour - Existing with Restriction Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Mission Blvd/Walnut Ave

Cycle (sec): 120 Critical Vol./Cap.(X): 0.992
 Loss Time (sec): 16 Average Delay (sec/veh): 49.4
 Optimal Cycle: OPTIMIZED Level Of Service: D

Street Name: Mission Blvd Walnut Ave
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Protected Protected Protected Protected
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
 Lanes: 1 0 1 1 0 1 0 2 0 1 2 0 1 0 1 1 0 0 1 0 0 1 0

Volume Module: >> Count Date: 13 Feb 2008 <<
 Base Vol: 307 729 24 8 1449 338 158 26 278 66 51 8
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 307 729 24 8 1449 338 158 26 278 66 51 8
 Added Vol: 0 48 0 0 94 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 307 777 24 8 1543 338 158 26 278 66 51 8
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
 PHF Volume: 327 828 26 9 1645 360 168 28 296 70 54 9
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 327 828 26 9 1645 360 168 28 296 70 54 9
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 327 828 26 9 1645 360 168 28 296 70 54 9

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.95 0.95 0.95 0.95 0.95 0.85 0.92 1.00 0.85 0.95 0.98 0.98
 Lanes: 1.00 1.94 0.06 1.00 2.00 1.00 2.00 1.00 1.00 1.00 0.86 0.14
 Final Sat.: 1805 3488 108 1805 3610 1615 3502 1900 1615 1805 1610 252

Capacity Analysis Module:
 Vol/Sat: 0.18 0.24 0.24 0.00 0.46 0.22 0.05 0.01 0.18 0.04 0.03 0.03
 Crit Moves: **** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 Green/Cycle: 0.18 0.63 0.63 0.01 0.46 0.46 0.13 0.19 0.19 0.04 0.09 0.09
 Volume/Cap: 0.99 0.38 0.38 0.38 0.99 0.49 0.36 0.08 0.99 0.99 0.36 0.36
 Delay/Veh: 96.1 10.9 10.9 69.0 52.3 23.1 48.0 40.5 98.5 161.5 52.4 52.4
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 96.1 10.9 10.9 69.0 52.3 23.1 48.0 40.5 98.5 161.5 52.4 52.4
 LOS by Move: F B B E D C D D F F D D
 HCM2k95thQ: 26 15 15 1 57 17 6 2 28 10 5 5

PM Peak Hour - Existing with Restriction Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Mission Blvd/Walnut Ave

Cycle (sec): 120 Critical Vol./Cap.(X): 0.763
 Loss Time (sec): 16 Average Delay (sec/veh): 33.9
 Optimal Cycle: OPTIMIZED Level Of Service: C

Street Name: Mission Blvd Walnut Ave
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Protected Protected Protected Protected
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
 Lanes: 1 0 1 1 0 1 0 2 0 1 2 0 1 0 1 1 0 0 1 0 0 1 0

Volume Module: >> Count Date: 13 Feb 2008 <<
 Base Vol: 310 1130 60 11 818 161 295 54 311 24 36 5
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 310 1130 60 11 818 161 295 54 311 24 36 5
 Added Vol: 0 124 0 0 38 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 310 1254 60 11 856 161 295 54 311 24 36 5
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
 PHF Volume: 333 1348 65 12 920 173 317 58 334 26 39 5
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 333 1348 65 12 920 173 317 58 334 26 39 5
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 333 1348 65 12 920 173 317 58 334 26 39 5

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.95 0.94 0.94 0.95 0.95 0.85 0.92 1.00 0.85 0.95 0.98 0.98
 Lanes: 1.00 1.91 0.09 1.00 2.00 1.00 2.00 1.00 1.00 1.00 0.88 0.12
 Final Sat.: 1805 3421 164 1805 3610 1615 3502 1900 1615 1805 1638 228

Capacity Analysis Module:
 Vol/Sat: 0.18 0.39 0.39 0.01 0.25 0.11 0.09 0.03 0.21 0.01 0.02 0.02
 Crit Moves: **** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 Green/Cycle: 0.24 0.57 0.57 0.01 0.33 0.33 0.23 0.27 0.27 0.02 0.06 0.06
 Volume/Cap: 0.76 0.70 0.70 0.70 0.76 0.32 0.39 0.11 0.76 0.76 0.39 0.39
 Delay/Veh: 50.0 19.6 19.6 140.1 38.6 30.1 39.4 32.9 47.9 124.9 56.6 56.6
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 50.0 19.6 19.6 140.1 38.6 30.1 39.4 32.9 47.9 124.9 56.6 56.6
 LOS by Move: D B B F D C D C D F E E
 HCM2k95thQ: 21 32 32 1 27 9 10 3 23 5 4 4

AM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

PM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #4 Mission Blvd/Stevenson Blvd

Cycle (sec): 70 Critical Vol./Cap.(X): 0.738
Loss Time (sec): 16 Average Delay (sec/veh): 20.5
Optimal Cycle: 66 Level Of Service: C

Street Name:	Mission Blvd			Stevenson Blvd																
Approach:	North Bound		South Bound		East Bound		West Bound													
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Split Phase				Split Phase							
Rights:	Include				Include				Ovl				Include							
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	2	0	1	1	0	1	0	2	0	1	1	1	0	0	2	1	0	0	1	
Volume Module: >> Count Date: 5 Feb 2008 <<																				
Base Vol:	400	1183	24	15	1006	192	333	21	613	18	14	23								
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Initial Bse:	400	1183	24	15	1006	192	333	21	613	18	14	23								
Added Vol:	0	124	0	0	38	0	0	0	0	0	0	0								
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0								
Initial Fut:	400	1307	24	15	1044	192	333	21	613	18	14	23								
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93								
PHF Volume:	432	1413	26	16	1129	208	360	23	663	19	15	25								
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0								
Reduced Vol:	432	1413	26	16	1129	208	360	23	663	19	15	25								
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
FinalVolume:	432	1413	26	16	1129	208	360	23	663	19	15	25								
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900								
Adjustment:	0.92	0.95	0.95	0.95	0.95	0.85	0.96	0.96	0.75	0.95	0.91	0.91								
Lanes:	2.00	1.96	0.04	1.00	2.00	1.00	1.88	0.12	2.00	1.00	0.38	0.62								
Final Sat.:	3502	3534	65	1805	3610	1615	3414	215	2842	1805	652	1071								
Capacity Analysis Module:																				
Vol/Sat:	0.12	0.40	0.40	0.01	0.31	0.13	0.11	0.11	0.23	0.01	0.02	0.02								
Crit Moves:	****			****			****		****			****								
Green/Cycle:	0.17	0.58	0.58	0.01	0.42	0.42	0.15	0.15	0.32	0.03	0.03	0.03								
Volume/Cap:	0.74	0.69	0.69	0.69	0.74	0.30	0.71	0.71	0.74	0.34	0.74	0.74								
Delay/Veh:	32.6	11.4	11.4	96.8	18.8	13.6	32.7	32.7	24.6	36.8	74.6	74.6								
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
AdjDel/Veh:	32.6	11.4	11.4	96.8	18.8	13.6	32.7	32.7	24.6	36.8	74.6	74.6								
LOS by Move:	C	B	B	F	B	B	C	C	C	D	E	E								
HCM2k95thQ:	9	21	21	1	19	6	11	11	17	2	5	5								

AM Peak Hour - Existing with Restriction Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 Mission Blvd/Driscoll Rd

Cycle (sec): 65 Critical Vol./Cap.(X): 0.811
 Loss Time (sec): 16 Average Delay (sec/veh): 19.3
 Optimal Cycle: OPTIMIZED Level Of Service: B

Street Name: Mission Blvd Driscoll Rd
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Protected Protected Split Phase Split Phase
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
 Lanes: 2 0 1 1 0 1 0 1 1 0 0 1 1 0 1 0 1 0 1

Volume Module:
 Base Vol: 134 1060 33 23 1205 167 276 31 197 32 21 11
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 134 1060 33 23 1205 167 276 31 197 32 21 11
 Added Vol: 0 48 0 0 94 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 134 1108 33 23 1299 167 276 31 197 32 21 11
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97
 PHF Volume: 139 1146 34 24 1343 173 285 32 204 33 22 11
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 139 1146 34 24 1343 173 285 32 204 33 22 11
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 139 1146 34 24 1343 173 285 32 204 33 22 11

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.92 0.95 0.95 0.95 0.93 0.93 0.96 0.96 0.85 0.95 1.00 0.85
 Lanes: 2.00 1.94 0.06 1.00 1.77 0.23 1.80 0.20 1.00 1.00 1.00 1.00
 Final Sat.: 3502 3492 104 1805 3144 404 3269 367 1615 1805 1900 1615

Capacity Analysis Module:
 Vol/Sat: 0.04 0.33 0.33 0.01 0.43 0.43 0.09 0.09 0.13 0.02 0.01 0.01
 Crit Moves: **** * * * * * * * * * * * *
 Green/Cycle: 0.05 0.55 0.55 0.02 0.53 0.53 0.16 0.16 0.16 0.02 0.02 0.02
 Volume/Cap: 0.81 0.59 0.59 0.59 0.81 0.81 0.56 0.56 0.81 0.81 0.51 0.31
 Delay/Veh: 55.1 10.1 10.1 53.1 15.5 15.5 26.7 26.7 44.2 103.2 40.8 36.1
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 55.1 10.1 10.1 53.1 15.5 15.5 26.7 26.7 44.2 103.2 40.8 36.1
 LOS by Move: E B B D B B C C D F D D
 HCM2k95thQ: 3 15 15 1 23 23 8 8 12 4 2 1

PM Peak Hour - Existing with Restriction Conditions
 Niles Canyon Road Truck Restriction Study
 City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 Mission Blvd/Driscoll Rd

Cycle (sec): 65 Critical Vol./Cap.(X): 1.059
 Loss Time (sec): 16 Average Delay (sec/veh): 49.9
 Optimal Cycle: OPTIMIZED Level Of Service: D

Street Name: Mission Blvd Driscoll Rd
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Protected Protected Split Phase Split Phase
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
 Lanes: 2 0 1 1 0 1 0 1 1 0 0 1 1 0 0 1 1 0 0 1 0 1

Volume Module: >> Count Date: 18 Nov 2009 <<
 Base Vol: 277 1021 34 2 1285 230 169 26 286 61 81 13
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 277 1021 34 2 1285 230 169 26 286 61 81 13
 Added Vol: 0 124 0 0 38 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 277 1145 34 2 1323 230 169 26 286 61 81 13
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
 PHF Volume: 299 1238 37 2 1430 249 183 28 309 66 88 14
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 299 1238 37 2 1430 249 183 28 309 66 88 14
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 299 1238 37 2 1430 249 183 28 309 66 88 14

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.92 0.95 0.95 0.95 0.93 0.93 0.96 0.96 0.85 0.95 1.00 0.85
 Lanes: 2.00 1.94 0.06 1.00 1.70 0.30 1.73 0.27 1.00 1.00 1.00 1.00
 Final Sat.: 3502 3492 104 1805 3008 523 3155 485 1615 1805 1900 1615

Capacity Analysis Module:
 Vol/Sat: 0.09 0.35 0.35 0.00 0.48 0.48 0.06 0.06 0.19 0.04 0.05 0.01
 Crit Moves: **** * * * * * * * * * * * *
 Green/Cycle: 0.08 0.53 0.53 0.00 0.45 0.45 0.18 0.18 0.18 0.04 0.04 0.04
 Volume/Cap: 1.06 0.67 0.67 0.67 1.06 1.06 0.32 0.32 0.32 1.06 0.84 1.06 0.20
 Delay/Veh: 99.9 12.2 12.2 256.9 58.1 58.1 23.4 23.4 23.4 95.8 82.8 147 31.4
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 99.9 12.2 12.2 256.9 58.1 58.1 23.4 23.4 23.4 95.8 82.8 147 31.4
 LOS by Move: F B B F E E C C F F F C
 HCM2k95thQ: 10 18 18 0 42 42 4 4 23 7 10 1

AM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Mission Blvd/Palm Ave

Cycle (sec): 155 Critical Vol./Cap.(X): 1.106
Loss Time (sec): 16 Average Delay (sec/veh): 73.4
Optimal Cycle: 180 Level Of Service: E

Street Name:	Mission Blvd			Palm Ave											
Approach:	North Bound		South Bound		East Bound										
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected		Protected		Permitted		Permitted								
Rights:	Include		Include		Include		Include								
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0

Volume Module:													
Base Vol:	135	981	66	55	1395	270	107	1	173	76	8	39	
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	135	981	66	55	1395	270	107	1	173	76	8	39	
Added Vol:	0	48	0	0	94	0	0	0	0	0	0	0	
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0	
Initial Fut:	135	1029	66	55	1489	270	107	1	173	76	8	39	
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
PHF Volume:	173	1319	85	71	1909	346	137	1	222	97	10	50	
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0	
Reduced Vol:	173	1319	85	71	1909	346	137	1	222	97	10	50	
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	173	1319	85	71	1909	346	137	1	222	97	10	50	

```

Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:   0.95 0.94 0.94 0.95 0.93 0.93 0.74 0.74 0.74 0.51 0.51 0.51
Lanes:        1.00 1.88 0.12 1.00 1.69 0.31 0.38 0.01 0.61 0.62 0.06 0.32
Final Sat.:   1805 3362 216 1805 2986 541 535 5 866 601 63 308
-----
```

Capacity Analysis Module:													
Vol/Sat:	0.10	0.39	0.39	0.04	0.64	0.64	0.26	0.26	0.26	0.16	0.16	0.16	0.16
Crit Moves:	****			****		****							
Green/Cycle:	0.09	0.60	0.60	0.06	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Volume/Cap:	1.11	0.65	0.65	0.65	1.11	1.11	1.11	1.11	1.11	0.70	0.70	0.70	0.70
Delay/Veh:	173.8	20.6	20.6	84.2	88.1	88.1	140.9	141	140.9	64.0	64.0	64.0	64.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	173.8	20.6	20.6	84.2	88.1	88.1	140.9	141	140.9	64.0	64.0	64.0	64.0
LOS by Move:	F	C	C	F	F	F	F	F	F	E	E	E	E
HCM2k95thQ:	20	37	37	6	105	105	41	41	41	15	15	15	15

PM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Repo

2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Mission Blvd/Palm Ave

Cycle (sec):	155	Critical Vol./Cap.(X):	0.723
Loss Time (sec):	16	Average Delay (sec/veh):	22.6
Optimal Cycle:	81	Level Of Service:	C

Street Name:	Mission Blvd			Palm Ave		
Approach:	North Bound		South Bound		East Bound	
Movement:	L - T - R		L - T - R		L - T - R	L - T - R
Control:	Protected		Protected		Permitted	Permitted
Rights:	Include		Include		Include	Include
Min. Green:	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	0

Volume Module:	71	1133	6	21	1236	180	113	11	59	4	3	8
Base Vol:	71	1133	6	21	1236	180	113	11	59	4	3	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	71	1133	6	21	1236	180	113	11	59	4	3	8
Added Vol:	0	124	0	0	38	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	71	1257	6	21	1274	180	113	11	59	4	3	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	80	1412	7	24	1431	202	127	12	66	4	3	9
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	1412	7	24	1431	202	127	12	66	4	3	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	80	1412	7	24	1431	202	127	12	66	4	3	9

Saturation	Flow	Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.93	0.93	0.76	0.76	0.76	0.87	0.87	0.87		
Lanes:	1.00	1.99	0.01	1.00	1.75	0.25	0.62	0.06	0.32	0.27	0.20	0.53		
Final Sat.:	1805	3589	17	1805	3103	438	889	87	464	440	330	879		

Capacity Analysis Module:														
Vol/Sat:	0.04	0.39	0.39	0.01	0.46	0.46	0.14	0.14	0.14	0.14	0.01	0.01	0.01	0.01
Crit Moves:	****				****		****							
Green/Cycle:	0.06	0.68	0.68	0.02	0.64	0.64	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Volume/Cap:	0.72	0.58	0.58	0.58	0.72	0.72	0.72	0.72	0.72	0.72	0.05	0.05	0.05	0.05
Delay/Veh:	92.3	13.7	13.7	94.6	20.0	20.0	67.0	67.0	67.0	50.5	50.5	50.5	50.5	50.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	92.3	13.7	13.7	94.6	20.0	20.0	67.0	67.0	67.0	50.5	50.5	50.5	50.5	50.5
LOS by Move:	F	B	B	F	C	C	E	E	E	D	D	D	D	D
HCM2k95thQ:	8	32	32	2	41	41	19	19	19	1	1	1	1	1

AM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Mission Boulevard/I-680 SB Ramps

Cycle (sec): 55 Critical Vol./Cap.(X): 0.803
Loss Time (sec): 12 Average Delay (sec/veh): 12.8
Optimal Cycle: 61 Level Of Service: B

Street Name:	Mission Boulevard			I-680 SB Ramps
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Ignore
Min. Green:	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0
Lanes:	1	0	2	0

```

Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:   0.95 0.95 1.00 1.00 0.90 0.90 1.00 1.00 1.00 0.85 0.85 1.00
Lanes:        1.00 2.00 0.00 0.00 1.93 1.07 0.00 0.00 0.00 0.99 0.01 1.00
Final Sat.:   1805 3610      0      0 3300 1828      0      0      0 1609      8 1900

```

Capacity Analysis Module:													
Vol/Sat:	0.04	0.28	0.00	0.00	0.44	0.44	0.00	0.00	0.00	0.00	0.14	0.14	0.00
Crit Moves:	****				*****						****		
Green/Cycle:	0.05	0.60	0.00	0.00	0.55	0.55	0.00	0.00	0.00	0.00	0.18	0.18	0.00
Volume/Cap:	0.80	0.46	0.00	0.00	0.80	0.80	0.00	0.00	0.00	0.00	0.80	0.80	0.00
Delay/Veh:	64.4	6.1	0.0	0.0	11.6	11.6	0.0	0.0	0.0	0.0	36.6	36.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	64.4	6.1	0.0	0.0	11.6	11.6	0.0	0.0	0.0	0.0	36.6	36.6	0.0
LOS by Move:	E	A	A	A	B	B	A	A	A	D	D	D	A
HCM2k95thQ:	3	9	0	0	18	18	0	0	0	12	12	12	0

PM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Mission Boulevard/I-680 SB Ramps

cycle (sec):	55	Critical Vol./Cap.(X):	0.539
loss Time (sec):	12	Average Delay (sec/veh):	9.7
optimal Cycle:	39	Level Of Service:	A

```

volume Module:
base Vol:    58  938      0      0   850     450      0      0      0      161      8    574
rowth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00 1.00 1.00 1.00 1.00
initial Bse: 58  938      0      0   850     450      0      0      0      161      8    574
dded Vol:    0      0      0      0   38       0      0      0      0      0      0    124
asserByVol:  0      0      0      0   0       0      0      0      0      0      0      0
initial Fut: 58  938      0      0   888     450      0      0      0      161      8    698
ser Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00 1.00 1.00 1.00 1.00
HF Adj:    0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94 0.94 0.94 0.94 0.94
HF Volume: 62  998      0      0   945     479      0      0      0      171      9    0
educt Vol:   0      0      0      0   0       0      0      0      0      0      0      0
duced Vol:  62  998      0      0   945     479      0      0      0      171      9    0
CE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00 1.00 1.00 1.00 1.00
LF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00 1.00 1.00 1.00 1.00
inalVolume: 62  998      0      0   945     479      0      0      0      171      9    0
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

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saturation Flow Module:
at/Lane:   1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
adjustment: 0.95 0.95 1.00 1.00 0.90 0.90 1.00 1.00 1.00 0.86 0.86 1.00
lanes:      1.00 2.00 0.00 0.00 1.99 1.01 0.00 0.00 0.00 0.95 0.05 1.00
final Sat.: 1805 3610    0    0 3414 1730    0    0    0 1551   77 1900

```

```

Capacity Analysis Module:
ol/Sat:   0.03 0.28 0.00 0.00 0.28 0.28 0.00 0.00 0.00 0.11 0.11 0.00
rit Moves: **** * ****
reen/Cycle: 0.06 0.58 0.00 0.00 0.51 0.51 0.00 0.00 0.00 0.20 0.20 0.00
olume/Cap: 0.54 0.48 0.00 0.00 0.54 0.54 0.00 0.00 0.00 0.54 0.54 0.00
elay/Veh: 30.0 7.0 0.0 0.0 9.2 9.2 0.0 0.0 0.0 21.3 21.3 0.0
ser DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
djDel/Veh: 30.0 7.0 0.0 0.0 9.2 9.2 0.0 0.0 0.0 21.3 21.3 0.0
OS by Move: C A A A A A A A A C C C A
CM2k95thq: 2 10 0 0 11 11 0 0 0 7 7 0

```

AM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Mission Blvd/I-680 NB Ramps

Cycle (sec):	55	Critical Vol./Cap.(X):	0.769
Loss Time (sec):	16	Average Delay (sec/veh):	20.7
Optimal Cycle:	62	Level Of Service:	C

Street Name:	Mission Blvd			I-680 NB Ramps		
Approach:	North Bound	South Bound	East Bound	West Bound		
Movement:	L - T - R	L - T - R	L - T - R	L - T - R		

Control:	Protected		Protected		Split Phase		Split Phase	
Rights:	Include		Ignore		Include		Include	

Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	1	0	0	0	1

Volume Module:

Base Vol:	99	650	17	107	1002	438	370	45	19	24	45	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	99	650	17	107	1002	438	370	45	19	24	45	29
Added Vol:	0	0	0	0	0	94	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	99	650	17	107	1002	532	370	45	19	24	45	29
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	106	699	18	115	1077	0	398	48	20	26	48	31
Reducut Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	106	699	18	115	1077	0	398	48	20	26	48	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	106	699	18	115	1077	0	398	48	20	26	48	31

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.98	0.98	0.85
Lanes:	1.00	1.95	0.05	1.00	2.00	1.00	1.74	0.18	0.08	0.35	0.65	1.00
Final Sat.:	1805	3504	92	1805	3610	1900	3154	327	138	650	1218	1615

Capacity Analysis Module:

Vol/Sat:	0.06	0.20	0.20	0.06	0.30	0.00	0.13	0.15	0.15	0.04	0.04	0.02
Crit Moves:	****			****			****			****		
Green/Cycle:	0.08	0.35	0.35	0.11	0.39	0.00	0.19	0.19	0.19	0.05	0.05	0.05
Volume/Cap:	0.77	0.57	0.57	0.57	0.77	0.00	0.66	0.77	0.77	0.77	0.77	0.37
Delay/Veh:	47.5	15.0	15.0	26.8	17.3	0.0	22.7	27.0	27.0	56.3	56.3	28.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.5	15.0	15.0	26.8	17.3	0.0	22.7	27.0	27.0	56.3	56.3	28.0
LOS by Move:	D	B	B	C	B	A	C	C	C	E	E	C
HCM2k95thQ:	7	11	11	4	15	0	10	12	12	6	6	2

PM Peak Hour - Existing with Restriction Conditions
Niles Canyon Road Truck Restriction Study
City of Fremont

Niles Canyon Road Truck Restriction Study – Initial Study
Freeway Operations - Interstate 680 between State Route 84 and Mission Boulevard

Existing Conditions				
Segment	Capacity	Volume	v/c	LOS
Southbound	7400	8127	1.10	F
	7400	3573	0.48	B
Northbound	8000	2978	0.37	B
	8000	7278	0.91	E

Restriction Conditions					
Added Volume	PCE	Total Volume	v/c	LOS	Change in v/c
47	118	8245	1.11	F	0.02
19	48	3621	0.49	B	0.01
24	60	3038	0.38	B	0.01
62	155	7433	0.93	E	0.02

Passenger Car Equivalent (PCE) applied: 2.5

Note: v/c = Volume to Capacity Ratio; PCE from Highway Capacity Manual 2010, Exhibit 14-12

Volume Source: Count data provided by Caltrans

memorandum



Date: February 15, 2012

To: **Mr. Kunle Odumade**
City of Fremont

From: Mark Spencer
Tony Henderson

Project: FRM007

**Whitlock & Weinberger
Transportation, Inc.**

475 14th Street
Suite 290
Oakland, CA 94612

voice (510) 444-2600

website www.w-trans.com
email thenderson@w-trans.com

Subject: Niles Canyon Road Truck Restriction Study – Comments Received at the January 18, 2012 Stakeholders Meeting

This memorandum summarizes verbal and written comments made by attendees of the January 18, 2012 Stakeholders Meeting for the Niles Canyon Road Truck Restriction Study. Attached is a copy of the meeting sign-in sheet, written comments received at the meeting and comments received via email following the meeting. The comments below have been paraphrased based on notes taken during the meeting and written comments received.

Compliance and Enforcement Comments

- How will local severing trucks be distinguished from restricted trucks for enforcement purposes?
- Do truckers currently use Niles Canyon Road as a way of bypassing truck weigh stations? It is not known if the CHP believes that truck drivers use Niles Canyon Road in order to avoid going through the weigh station.
- How is compliance with existing hazardous material trucking restriction currently monitored?
- During field visits, was the California Highway Patrol (CHP) observed on the route?
- Confirm that the truck restriction would apply to just vehicles over 5 tons (10,000 pounds).
- No input has yet been received from the CHP regarding the proposed restriction on Niles Canyon Road.

Collision and Safety Comments

- Original Caltrans data showed higher rate of truck collisions than currently reported, but these data included pick-up trucks.
- Pick-up trucks represented a large portion of the “truck” collisions.
- No spike in collisions can be attributed to large (5+tons) trucks.
- Trucks can influence the behavior of other drivers. An example given is a driver who chooses to leave larger gaps when near a truck, or drive faster when no trucks are present.

- Requested a lower speed limit on Niles Canyon Road or other traffic calming measures such as flashing lights and rumble strips.
- Consider installation of a traffic signal at the intersection of Niles Canyon Road/Palomaras Road.

General Comments

- There are non-safety issues and possible benefits associated with a restriction. Examples given included wear and tear of the road, designation as a scenic route, and social impacts. Also, the overall impact to perceived driving conditions may be better including comfort of other drivers. Any incremental improvement, regardless of how small or large, would be beneficial in terms of safety and other factors. It was acknowledged, however, that some of these are difficult to predict or measure.
- Has the School District been included as a stakeholder? There are schools along or near Mission Boulevard which could be impacted by addition truck traffic on an already congested facility during pickup and drop-off times.
- What would happen if the City decides to request the restriction, but Caltrans denies the request?
- Is there a difference in fuel consumption between Niles Canyon Road and alternative truck routes?
- Travel time measurements conducted for the Initial Study assumed a starting and stopping point at Mission Boulevard/Niles Canyon Road, but the difference travel times could vary depending on the actual starting and stopping point. The example given was a truck driver destined for a location on Mission Boulevard south of Niles Canyon Road; their travel time may be less than a truck starting or ending elsewhere.
- Niles Canyon Road is approximately one mile shorter than using I-680 and Mission Boulevard.

City Staff Comments:

- The original intent of the study was data gathering since the City had very little data on the operations of Niles Canyon Road. This data would be used to determine if a restriction should be pursued and the likelihood of such a restriction being approved by Caltrans. An additional purpose of the data collection was to have more data available when reviewing the SR 84 route improvements proposed by Caltrans.
- For Auto Mall Parkway, it was the CHP that had requested that the City implement the current restriction out of concerns that truck drivers were using it as a method of avoiding the weigh station.

Caltrans Comments

- Clarify that Caltrans is neutral party to the proposed truck restriction and that the restriction study has been initiated by the City of Fremont.
- Ensure that all businesses along Niles Canyon Road are notified of the proposed restriction.

- Trucks for delivery services such as UPS and FedEx would generally exceed the weight limit, but would be exempted from the restriction if the driver is performing a delivery along Niles Canyon Road.
- Question if the restriction would achieve desired improvements in safety since the truck collision rate was determined to be proportionate to truck volumes on the street.
- Ask if analysis has been done on how the restriction would affect operations and pavement quality along Mission Boulevard.
- Would the proposed restriction impact truck noise and air quality near schools and residential neighborhoods?
- If the restriction is approved and truck traffic increases on Mission Boulevard, is there an increased likelihood for collisions on Mission Boulevard due to stop-and-go traffic as well as turning traffic at numerous cross-streets?

Trucking Association Representative Comments:

- The practice of bypassing scales is not supported by the Trucking Association, but they do acknowledge that some truck drivers do intentionally avoid scales.
- The trucking companies pay weight fees that are used for roadway maintenance.
- Trucking companies do not use routes that they consider unsafe as it would increase risks and costs. Any restriction, if enacted, would result in increased costs for the trucking industry which could ultimately result in increased costs to consumers.

Attachments: Meeting Attendee Sign-In Sheet
Written Comments Received
Emailed Comments Received

NILES CANYON ROAD TRUCK RESTRICTION STUDY

Stakeholders Meeting – January 18, 2012

Name	Address	Affiliation (if any)	Email Address	Include in Future Emails?
Jeff Miller	Po Box 2626 Niles 94536	ActA	clarendoncrete@hotmail.com	Yes
Steve Wilson	3607 Cicerca Ct Fremont Ca 94536	Save Niles Canyon	steve.wilson@yahoo.com	Yes
Cyrus Mashhoodi	111 Grand Ave Oakland	Caltrans	civus_mashhoodi@dot.ca.gov	Yes
Sue Chan	1895 Mowry Ave. #121 Fremont	City of Fremont	schanh@fremont.gov	✓
Art Carrera	399 Elmhurst St. Hayward CA 94541	HdA Co.	artc@acpwa.org	yes

NILES CANYON ROAD TRUCK RESTRICTION STUDY
Stakeholders Meeting – January 18, 2012

Name	Address	Affiliation (if any)	Email Address	Include in Future Emails?
Wiles Bowers	59 Marilyn Dr. Milpitas 95035	Fremont Bulletin	wbowers@themilpitaspost.com	yes
RJ Gerantes	4148 East Commercial Sacramento, CA 95834	California Trucking Assn.	rjgerantes@caltruck.org	yes
Eric Sauer	" "	" "	esauer@caltruck.org	yes
Mike Dubinsky	695 Posada Way Fremont 94536	Save Niles Canyon Group	dexrun9@comcast.net	yes
Robert Brienes	1221 Oak St., Ste. 536 Oakland, CA 94612	Supervisor Nadia Cookyer	robert.brienes@acgov.org	yes
Michelle Rose II	3626 Niles Blvd Fremont 94536	State Niles Council	maph17@comcast.net	yes
David Bainerovs	38873 Niles Rd Foothill 94536	Fremont Planning Commis. 3blcvwfrm.com	abuncors@3blcvwfrm.com	yes
Dawn Arnold			Marnie Arnold	✓
Dorothy Bradley	35970 Niles Blvd	general	comcast.net	✓

NILES CANYON ROAD TRUCK RESTRICTION STUDY

Comment Form

1. Do you think large trucks should be restricted on Niles Canyon Road? Yes _____ No _____

Why did you state Yes or No? There is no good reason for them to be in the canyon. They detract from the beauty of the "Scenic Highway." They also cause "friction,"

2. Do you drive a large truck (larger than a pick-up truck) on Niles Canyon Road? _____ Yes No _____

3. What would make Niles Canyon Road a better road for all drivers? Slow traffic

down & convince drivers that it is NOT a short-cut.
It is only one mile more on 680. Take the "Scenic Highway" designation to the next level. Preserve the beauty & animal habitat of this gem!

4. How often do you travel on Niles Canyon Road? 1-2 times per week

5. What times of day do you usually travel on Niles Canyon Road? No specific time,
I'm not a commuter.

6. Please provide any other comments that may help the City of Fremont in their study of a possible truck restriction on Niles Canyon Road: Drivers are under a false

assumption that Niles Canyon is significantly shorter than 680. It is not! There is a little over one mile difference. This area should be preserved.
This is a great first step,

Optional

Name: Steve Wilson Address: 36664 Cuenca Ct, Fremont, CA

E-Mail: steve.wilson@yahoo.com Phone No.: 510-793-3987

You can return this form to the desk at the Stakeholders Meeting, e-mail comments to kodumade@fremont.gov, or fold over and mail back to the City.

NILES CANYON ROAD TRUCK RESTRICTION STUDY

Comment Form

1. Do you think large trucks should be restricted on Niles Canyon Road? Yes _____ No _____

Why did you state Yes or No? I believe they should be

prohibited from using a designated Service Highway.

Niles Canyon Road shall be designated a Parkway

2. Do you drive a large truck (larger than a pick-up truck) on Niles Canyon Road? _____ Yes No _____

3. What would make Niles Canyon Road a better road for all drivers? lower speed limit

4. How often do you travel on Niles Canyon Road? 1 time per week

5. What times of day do you usually travel on Niles Canyon Road? mid-day

6. Please provide any other comments that may help the City of Fremont in their study of a possible truck restriction on Niles Canyon Road:

Find a way to determine whether

Large Trucks avoid the scale on Rd. 680

by using Niles Canyon Rd.

Optional

Name: Mike Dubinsky Address: 695 Reseda Way

E-Mail: foxrun9@comcast.net Phone No.: 494-9181

You can return this form to the desk at the Stakeholders Meeting, e-mail comments to kodumade@fremont.gov, or fold over and mail back to the City.

NILES CANYON ROAD TRUCK RESTRICTION STUDY

Comment Form

1. Do you think large trucks should be restricted on Niles Canyon Road? Yes _____ No _____

Why did you state Yes or No? To make the road safer, without highway widening that would damage the creek.

2. Do you drive a large truck (larger than a pick-up truck) on Niles Canyon Road? _____ Yes No _____

3. What would make Niles Canyon Road a better road for all drivers? Lower speed

limit; traffic calming measures such as rumble strips, flashing lights; traffic light at Palomares Road.

4. How often do you travel on Niles Canyon Road? 1-2 times per month

5. What times of day do you usually travel on Niles Canyon Road? mid-day

6. Please provide any other comments that may help the City of Fremont in their study of a possible truck restriction on Niles Canyon Road:
-
-
-

Optional

Name: Jeff Miller Address: ACA, Po Box 2626, Niles 94536
E-Mail: alamedacreek@hotmail.com Phone No.: 510-499-9185

You can return this form to the desk at the Stakeholders Meeting, e-mail comments to kodumade@fremont.gov, or fold over and mail back to the City.

NILES CANYON ROAD TRUCK RESTRICTION STUDY

Comment Form

1. Do you think large trucks should be restricted on Niles Canyon Road? Yes _____ No _____

Why did you state Yes or No? To make the road safer; it's common knowledge that one way to avoid truck scales is to cut through the canyon from Mission to LEO

2. Do you drive a large truck (larger than a pick-up truck) on Niles Canyon Road? _____ Yes No _____

3. What would make Niles Canyon Road a better road for all drivers? to make it plain that the road is a scenic highway, not a speedway, and should be used at slower speeds. Banning trucks on this curvy roadway would be safer for other drivers & for the creek

4. How often do you travel on Niles Canyon Road? often, but not as a commuter

5. What times of day do you usually travel on Niles Canyon Road? all times; mornings, evenings, weekends various times

6. Please provide any other comments that may help the City of Fremont in their study of a possible truck restriction on Niles Canyon Road: I believe that 84 should be redirected down LEO to Mission/238

Trucks should use LEO to reach Fremont. The road has value to society as a scenic highway and that value would be increased with the truck ban.

Optional

Name: Michelle Powell Address: 3690de Niles Blvd
E-Mail: mp117@comcast.net Phone No.: 510/797-1054

You can return this form to the desk at the Stakeholders Meeting, e-mail comments to kodumade@fremont.gov, or fold over and mail back to the City.

Tony Henderson

From: Kunle Odumade <kodumade@fremont.gov>
Sent: Wednesday, February 01, 2012 3:53 PM
To: Mark Spencer; Tony Henderson
Subject: Fwd: Re: Reminder: Comment Form for Niles Canyon TruckRestriction Study
Attachments: Niles Canyon Road Truck Restriction Study - Initial Study.pdf; Niles Canyon Truck Restriction Study - Comment Form Page 1.doc; Fold Here and Return Comment Page 2.doc; Comment Form pdf.pdf

This is the only comment I received on Monday.

Kunle Odumade, P.E.

Transportation Engineer

City of Fremont | Transportation Engineering
39550 Liberty Street, Fremont, CA 94538
Tel: 510.494.4746 | Fax: 510.494.4751

kodumade@fremont.gov | www.fremont.gov

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From: Cyrus Mashhoodi <cyrus_mashhoodi@dot.ca.gov>
To: Kunle Odumade <kodumade@fremont.gov>
CC: Roland Au-Yeung <roland_au-yeung@dot.ca.gov>, Melanie Brent <melanie_brent@dot.ca.gov>
Date: 1/30/2012 3:22 PM
Subject: Re: Reminder: Comment Form for Niles Canyon Truck Restriction Study

Hi Kunle,

Here are a few comments that we gathered. The document you provided is also being reviewed by our Headquarter Office of Truck Services. If I get any comments I will forward them to you.

Please make sure that the stake holders understand 10,000 pounds weight limit. This will prohibit truck over 10,000 pounds traveling on SR-84. Keep in mind, most UPS and FedEx trucks will be prohibited. However, since these trucks are considered delivery trucks, they will be exempt. So the question is, what are you accomplishing by the restriction, if approved. As you can see in the collision data, the number of Truck with one, two, or 3 trailers involved in accidents are very low.

On a memorandum dated January 4, 2012 under Study Purpose and Background, it is stated as follows; "The City of Fremont has initiated the process with the Caltrans" please note that Caltrans is a neutral party to the proposed Truck Restriction.

Please make sure that the affected businesses are notified of the proposed truck ban. There are a few wineries, and a rock quarry in the area that their businesses maybe impacted.

Thanks.

Cyrus Mashhoodi
District Truck Services Manager

Kunle Odumade
<kodumade@fremont
.gov> To
Christopher Miley
01/23/2012 11:45 <christopher.miley@acgov.org>, Dawn
AM Argula <dawn.argula@acgov.org>, Art
Carrera <artc@acpwa.org>, Kwablah
Attiogbe <kwablah@acpwa.org>,
Andrae Macapinlac
<andrae.macapinlac@asm.ca.gov>,
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<deepa.sharma@asm.ca.gov>, Jeff
Miller
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<cta@caltrux.org>, John Carman
<JCarman@chp.ca.gov>, Mike Dubinsky
<foxrun9@comcast.net>, Jim
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Bara-Gibson
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Mintze Cheng
<mintzec@unioncity.org>, Mark
Spencer <mspencer@w-trans.com>

cc

Subject
Reminder: Comment Form for Niles
Canyon Truck Restriction
Study

We had the Niles Road Truck Restriction Project's Stakeholders Meeting last Wednesday (01/18/2012). We had a good turnout, and received some comments (both verbally and written). We will incorporate all comments in the Final Truck Restriction Report that the City will submit to Caftans for their consideration to approve the truck restriction proposal.

I am attaching a copy of the Initial Study (PDF format) and the comment form (in both word and PDF format). Please send your comments to me by email, fax or direct mail by Monday, January 30, 2012.

Thanks.

Kunle Odumade, P.E.
Transportation Engineer
City of Fremont | Transportation Engineering
39550 Liberty Street, Fremont, CA 94538
Tel: 510.494.4746 | Fax: 510.494.4751
kodumade@fremont.gov | www.fremont.gov(See attached file: Niles Canyon Road Truck Restriction Study - Initial Study.pdf)(See attached file: Niles Canyon Truck Restriction Study - Comment Form Page 1.doc)(See attached file: Fold Here and Return Comment Page 2.doc)(See attached file: Comment Form pdf.pdf)

Mark Spencer

Subject: FW: Niles Canyon Road Truck Restriction - Initial Study(Comment from Caltrans)

From: Kunle Odumade [<mailto:kodumade@fremont.gov>]

Sent: Wednesday, January 25, 2012 9:55 AM

To: Mark Spencer; Tony Henderson

Subject: Fwd: Niles Canyon Road Truck Restriction - Initial Study(Comment from Caltrans)

Mark,

Below is the first comment from Caltrans regarding the Initial Study.

Thanks,

Kunle Odumade, P.E.

Transportation Engineer

City of Fremont | Transportation Engineering

39550 Liberty Street, Fremont, CA 94538

Tel: 510.494.4746 | Fax: 510.494.4751

kodumade@fremont.gov | www.fremont.gov

>>>

From: Saif Mamoon <saf_mamoon@dot.ca.gov>

To: <kodumade@fremont.gov>

CC: Emily Tang <emily_tang@dot.ca.gov>, <jpierson@fremont.gov>, RolandAu-Yeung <roland_au-yeung@dot.ca.gov>, Ron Kiaaina <ron_kiaaina@dot.ca.gov>, <aciviletti@fremont.gov>

Date: 1/17/2012 1:37 PM

Subject: Re: Niles Canyon Road Truck Restriction - Initial Study

Hello Kunle:

Comments on the Memo: Niles Canyon Road Truck Restriction - Initial Study as follows:

(1) Mission Boulevard (SR 238) between Niles canyon Road (SR 84) and Route 680 is proposed as an Alternative Truck Route. This stretch of Mission Bl. passes through residential neighborhood with multiple cross-streets and intersections. There are also few Schools within the vicinity of this stretch of Mission Bl. Has any study been done to find out what impact the truck noise will have on the residential neighborhood and Schools ? Also, any study been done for additional pollution ?

(2) Since large trucks (5 tons or larger) are slow moving vehicles and less adaptable to stop-and-go traffic, are there not increased likelihood of rear-end collisions, if not broadside type accidents on Mission Bl.?

(3) What impact will there be on potential traffic delay on Mission Bl.?

(4) Has any study been done to determine the impact of large 5 ton or larger trucks on the pavement conditions of

Mission Bl. ?

Please clarify the above mentioned items.

Thanks.

Saif Mamoon
Office of Traffic
Caltrans, Dist 4



**FREMONT
UNIFIED SCHOOL
DISTRICT**

BOARD OF EDUCATION

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<http://www.fremont.k12.ca.us>

March 6, 2012

Mr. Kunle Odumade
City of Fremont
P.O. Box 5006
Fremont, CA 94537

CITY OF FREMONT

MAR 09 2012

Transportation Engineering

Dear Mr. Odumade,

On behalf of the Fremont Unified School District, I am writing to express our concern about the possible impacts of a truck restriction in Niles Canyon and appreciate your outreach to us early in the process.

As you are aware, Mission Boulevard is a major thoroughfare for parents, students and staff of the Fremont Unified School District. The identified potential impact of 900 additional trucks along Mission Boulevard could present a serious negative impact to students and schools in the vicinity of Mission Boulevard. Traffic in the vicinity of Mission San Jose High School and Hopkins Junior High School is currently heavily impacted during morning drop-off and afternoon pick-up times. Additionally, parents of elementary school students in the adjacent community use Mission Boulevard to access Vallejo Mill Elementary, Gomes Elementary and Mission San Jose Elementary.

In addition to the identified impact of increased traffic and increased wait time at signals, we are also concerned that the restriction of trucks on Niles Canyon would add traffic congestion in an area with an abundance of less experienced teenage drivers, creating an additional concern for the community.

Finally, the City also needs to consider the impact of increased fuel emissions and noise on classrooms that are proximate to Mission Boulevard as an additional negative impact on schools in the community. Mission San Jose High School has several classrooms in close proximity to the street.

While we support efforts to explore alternatives to mitigate the impact on natural beauty of Niles Canyon, we believe that the city must also consider the impacts to the community as a whole. In summary, it is our position that the City should consider the impact not only on Niles Canyon but also the impact on, traffic, congestion, students, families, and schools in the community.

Sincerely yours, .

James Morris
James Morris
Superintendent

cc: Board of Education Members

Sandy Prairie, Principal of Mission San Jose High School

Mary Miller, Principal of Hopkins Junior High School

Douglas Whipple, Principal, Gomes Elementary School

Mary Lou Ulloa, Principal, Vallejo Mill Elementary School